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# F O S S I L S

A R R A N G E D

ACCORDING TO THEIR

O B V I O U S C H A R A C T E R S ;

W I T H T H E I R

H I S T O R Y A N D D E S C R I P T I O N ;

U N D E R T H E A R T I C L E S O F

F O R M,		S U R F A C E,
H A R D N E S S,		C O L O U R, A N D
W E I G H T,		Q U A L I T I E S ;

The P L A C E of their P R O D U C T I O N,

T H E I R U S E S,

A N D

D i s t i n c t i v e E N G L I S H, and C l a s s i c a l L A T I N N A M E S.

B Y J. H I L L, M. D.

M E M B E R O F T H E I M P E R I A L A C A D E M Y.

L O N D O N :

P R I N T E D F O R R. B A L D W I N, I N P A T E R - N O S T E R R O W ;

A N D P. E L M S L Y, I N T H E S T R A N D.

M. DCC. LXXI.





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# INTRODUCTION.

**T**HE purpose here is to lay down an arrangement of Fossils; founded on their obvious characters, and sensible qualities: according to which they may be known, and disposed in method; without the skill of Chemistry, or the fatigue of experiments: without furnaces, or aqua fortis.

Those arts and instruments may be needful to ascertain their nature; but we are here employed only on their outward form, and character: the other part of the science, which is indeed the most essential, will follow the more easily: for things, before they are deeply examined, ought first to be known.

In this method nothing will be admitted as an article of distinction, but what is to be perceived at once, by the sight, smell, taste, or touch. Good sense alone will be required to arrange Fossils according to these palpable and unerring guides; and the system will serve for all cabi-



nets; because it comprehends all the Fossils that are known to exist.

From these determinations alone of our senses, will be given a detail of the differences we find in Fossils; under the heads of Form, Hardness, Weight, Surface, Colour, and Qualities, as distinguished by the taste, smell, or touch.

These distinctive marks will be disposed separately in so many columns; and to these will be added two more for the history of the bodies: comprehending the place where they are found; and uses to which they serve.

Thus the few words in our six first columns read together, will give the *Specific Character* of every Fossil: and those of the two last will add what is essential in its history and value.

A Table of Classes will be prefixed to all; in which the method will appear at one View.

The distinction of each Class will be added at the head of each: and after this, subordinate characters of the several genera. These, like the rest, will be founded only on obvious characters; and from these the detail of species will be regularly pursued.

These



These Characters cannot be so absolute and determinate, as those which mark the like great distinctions among Animals and Vegetables. It is impossible they should: Fossils, not being organic bodies, produced by eggs or seeds, are not themselves so determinate and distinct: and it would be preposterous to attempt in the distribution, what nature has not done in their construction.

The greater distinctions are the nearest being absolute; for so much the simplicity of nature in these bodies allows: all subordinate differences are less determinate; and the lower we descend, the more equivocal must be the marks. The Characters of Genera therefore are liable to exception often; and those of what we are content to call Species, in this Kingdom, always.

The great and essential difference of Species and Variety, so useful in Plants, is lost in Fossils; it would be happy if it were otherwise: but 'tis idle to speak of things any way but as they are.

The terms of difference between Species and Species, are every where expressed at the heads of the several columns; and these are all placed in each Page, because usually most of them are requisite; though 'tis according



to the general nature of the bodies, that one or other of them becomes most essential: each Class has its different qualities, that more or less determine the Species of the objects it comprehends; and in this way all the marks are always ready.

Thus in *Stones*, the Characters of FORM, HARDNESS, WEIGHT, and SURFACE, are most essential; among the *Crystals* and *Spars*, FORM and COLOUR; with *Earths* and with the *Talcs*, FATTINESS; in the *Salts*, TASTE; and with the *Sulphurs*, SMELL. The terms of place belong to all; and (where they have been brought to serve the purpose of Life,) their uses.

In the application of these terms to the several Fossils, they are always given comparatively; and have reference to the other Bodies of the same Genus. The Classes separate very different things from one another; and the lesser distinction of Genus yet farther divides those of each alliance: the Character of the Class, and that of the Genus, are always to be carried in the mind, in addition to the distinctive mark of the Species: and as the articles expressed in our columns are intended to refer only to the Fossils of the same name, when 'tis said that bodies are hard, or soft, light, or heavy, it means nothing absolute; but is only to be

under-



understood as hard, or soft, in comparison of others of that kind : and so of all the rest.

In the same manner the article of place is not meant as singular, or particular ; for many Fossils are in a manner universal : 'tis only intended to say, that such or such a Country is one of those where this or that Fossil is found.

With respect to other Authors, their systems have been founded on principles so different from those which direct all things in this, that references to them are not very necessary : the information intended to be given here, is meant to be conveyed at once ; and to be itself sufficient for the distinctive knowledge of the body. However, to comply with custom ; and mark the way to farther enquiry, the name of the Author, who seems to have best understood the body in question, is annexed always to its Latin name, by the initial letter. The Reader will be pleased therefore to know, that in these places,

W stands for Wallerius.

B for Bomare.

L for Linnæus.

H for my history of Fossils.

And that where the letter N is added, the Body described is a new Species.



As I have had the advantage of more than twenty years experience since the publication of the Book just named; I find I shall have many Species to add, which were not known at all at that time; and several to retrench, which are better known now: and where the same faithful guide directs me, I shall not scruple to take the same liberty with the opinions of others, as to the Species; that I have taken with my own.

Large Histories may be written on the nature of the several subjects; but the purpose here is nothing more than that previous acquaintance with the Bodies, which is the first essential enquiry: the plan is to make that as certain, as obvious, and as familiar, as the nature of the subject will admit: and of all things, to express it in as few words as possible.

The annexed table will give the course of the arrangement that is to be used: in which, it seems essential to begin with the simplest bodies: for otherwise, 'tis impossible to comprehend the description of those which are composed of several kinds.



## NATIVE FOSSILS.

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 CLASS I.

## TALC.

## TALCUM.

A pure Fossil: composed of flexible and elastic  
Plates.

**T**ALC is LIABLE TO BE tinged by mineral Steams ;  
clouded by subterranean Fires ;  
fouled by admixture of earths ;  
broken by the force it suffered while among  
fluid Matter ;  
distorted by the concretion of Stones, in which  
it lies ;  
debas'd by an admixture of their Matter ;  
and intermixed with similar Fossils.

Hence, tho' naturally transparent, it becomes some-  
times opake ; alters its form ; and loses in like manner of  
its flexibility.

Therefore Talc, in the condition we see it in the earth,  
is to be separated into various Genera, and Species ; ac-  
cording to those differences, and other accidents.



T A L C.

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G E N U S I.

I S I N G L A S S.

V I T R U M.

Composed of broad, flat, close, polished Plates.



FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. MUSCOVY ISINGLASS.							
In broad maffes	the plates flexible	very light	glossy	BROWNISH	soft	Ruffia, in rocks	Mica Membranacea, W. for windows, lanterns, &c.
2. DANISH ISINGLASS.							
Large thick maffes	plates tough	heavy	shining	WHITISH	fatty	Denmark, Sweden, Norway	Mica Laminosa, L. windows.
3. INDIAN ISINGLASS.							
Thin cakes	plates most flexible	very light	polished	PALE YELLOW	unctuous	Coromandel	Verre de Muscovie jaune, B. as glafs.
4. PERSIAN ISINGLASS.							
Round lumps	plates elastic	quivering	shivery	PALE RED	smooth	Island of Ormus, in red earth	Vitrum Perficium, H. covering miniatures.



FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
5. FRENCH ISINGLASS.							
Broad cakes	plates scarce elastic	heavy	undulated	BROWN	fatty	Champaign, in rocks, by rivers	Vitrum Gallicum. H. as glafs, but poorly.
6. ICELAND ISINGLASS.							
Broad mafes	plates brittle	light	shivery	WHITE	harsh	Mount He- cla	Vitrum Islandicum. N.
7. HUNGARIAN ISINGLASS.							
Irregular lumps	plates brittle	heavy	scaly	YELLOW	unctuous	Cremnitz, in mines	Mica Hungarica. L.
8. ORPIMENT ISINGLASS. ORPIMENT.							
Uneven maf- fes	plates brittle	heavy	undulated	GREENISH YELLOW	fatty, sul- phureous	Saxony, in mines	Vitrum Auripigmentum. H. a yellow paint



T A L L C.

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G E N U S II.

G L I M M E R.

M I C A.

Composed of small, loose, irregular, shining Scales.



FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. GOLD GLIMMER. In small rough masses	rigid	heavy	scaly	YELLOW	dry	Germany*	Mica Aurea. W.
2. SILVER GLIMMER. Larger un- ven lumps	flexible	light	wavy	WHITE	fatty	Germany	Mica Argentea. W.
3. GREEN GLIMMER. Small rough lumps	hard	heavy	scaly	BRIGHT GREEN	harsh	Germany, in mines	Mica Viridis. W.
4. BLACK GLIMMER. Great rug- ged lumps	very hard	heavy	oblong and freaky	BLACK	harsh	Denmark, in mines	Mica Decussata. L.
5. RED GLIMMER. In small rude lumps	tender	heavy	rugged	RUDDY	fattish	Saxony, in mines	Mica Rubra. W.



6. VENETIAN GLIMMER.

VENICE TALC.

In uneven maffes | foft. | heavy

7. CONVEX GLIMMER.

In fmall half-round lumps | tender | light

8. UPRIGHT GLIMMER.

Large and uneven | ftony | heavy

9. TWISTED GLIMMER.

Rude maffes | foft | heavy

10. STREAKY GLIMMER.

Flat pieces | brittle | heavy

GREENISH  
WHITE

moft fatty

Norberg,  
in rocks

Mica Talcosa,  
L.

a cofmetic.

SILVERY

fmooth

Finland,  
in clay

Mica Hæmifpherica,  
W.

rais'd,  
three-corner'd, fplit

harfh

Sweden,  
in mines

Mica Cryftallina,  
L.

YELLOW

fatty

Hartz foreft,  
in mines

Mica Undulata,  
W.

GREY

dry

Saxony,  
in rocks

Mica Radians,  
W.

\* Perhaps this is the Mica Nigra, calcined by fubterranean Fires; for that becomes yellow, when burnt.



T A L L C.



G E N U S III.

B L A C K L E A D.

M O L Y B D Æ N U M.

Composed of minute, fatty, irregular, and close-connected Scales, staining the hands.



FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. PURE BLACK LEAD.							
Compact	tender	light	smooth	GLOSSY BLACK	fatty	England and Germany, in hills	Molybdænum Impalpabile. L.  lead pencils.
2. SCALY BLACK LEAD.							
Brittle	soft	heavy	tilly	DEAD BLACK	smooth	Sweden, in mountains	Molybdænum Subsquamosum. L.  pencils.
3. PLATED BLACK LEAD.							
Shattery	brittle	light	uneven	GREY BLACK	soft	Germany, in mines	Molybdænum Sablamellosum. L.  pencils.
4. DUSTY BLACK LEAD.							
Sooty	firm	heavy	rough	BLACK	dry	Goffelaer, in mines	Molybdænum Compactum. L.  a black paint.



FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
							Molybdænum Intricatum, L.
		5. PERPLEX'D BLACK LEAD.					
Streaky	hard	heavy	thready	BLACK	rough	France, in rocks	a blacking
		6. RADIATED BLACK LEAD.					Molybdænum Radiatum, L.
Streaked	hard	heavy	raised in ridges	GREYISH BLACK	dry	Sweden, in mines	for colouring earthen ware
		7. KIDNEY BLACK LEAD.					Molybdænum Reniforme, L.
Chaffy	soft	light	duffy	DEAD BLACK	dry	Germany	for crucibles



8. SANDY BLACK LEAD.

Rugged | crumbly | heavy

9. WOLF BLACK LEAD.

Uneven | soft | very heavy

10. DINGY BLACK LEAD.

Gritty | very hard | heavy

11. BRIGHT BLACK LEAD.

Flaky | hard | heavy

Molybdæna  
Impura.  
W.

Banks of the  
Rhine

harsh

BROWN  
BLACK

uneven

Molybdænum  
Sperma Lupi.  
L.

Westmore-  
land, in the  
hills

very  
unctuous

REDDISH  
BLACK

wavy

Molybdæna  
Teffularis.  
W.

Upland

unctuous

GREYISH  
BLACK

confused

Talcum  
Cubicum.  
B.

Bohemia

fatty

YELLOWISH  
BLACK

raised in  
dice



**T**HE Structure of these, and the Bodies of the three following Genera, are best seen in the sides of rough masses ; rude as they are taken from the earth : where these are wanting, it is best seen in a piece newly broken, viewed crosswise.

In general, where the eye is not able to see it plainly, a reading-glass is to be used ; and for the most confused kinds, a glass of more power.



T A L L C.

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G E N U S IV.

S O A P R O C K.

S M E C T I S.

Composed of small, regular, fatty, tender, and close-connected Flakes; formed into a compact smooth mass.



**W**E shall begin to see, in this Genus, and from thence be led perfectly, in the three succeeding ones, to distinguish the way by which Nature gradually descends, from the purity and perfection of the finer Bodies in each Class; to those so foul, and imperfect, that we at last lose sight of what they are.

The opake black Touchstone differs as much from the bright Russian Isinglass, as one thing well can differ in its aspect from another: yet, when all are thus traced through their gradations, we cannot doubt but it is the last of Talcs.

The Characters of these Fossils are plainest in the purest; the Isinglass: but even there, the Hecla kind loses its transparency. They begin to degenerate in the Glimmers; they are yet less distinct in the Black Leads; and in these Soaprocks, and the succeeding Genera, the eye scarce perceives the plated structure: but still they are, in all, the same. Unformed Talc, or the substance of the Talcs, not formed into plates, often mixes with their flakes; and confuses them: but having seen these flakes in the purest Isinglass, they will be traced by the eye a great way thro' the Glimmers: a little assistance will shew them in Black Lead, and even in all these: and all the while, their smoothness to the touch, and fatty quality, deduced only from their broken plates, declare them every where.

The more opake of these Bodies will be repeated under the head of hardened earths, &c. with references to their just place here: and this seems as much as Nature allows to the methodical arrangement of Fossils; which have not been formed with those absolute and distinctive characters we trace in the two higher orders of created Bodies.

SOAPROCK.



FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. CORNSH SOAPROCK.							
In rude lumps	tender	heavy	marbled	RED AND WHITE	very fatty	Cornwall	Talcum Smeectis Opacum. L. for porcelain.
2. CHINA SOAPROCK.							
In great masses	hard	heavy	rugged	GREYISH WHITE	fatty	China	Talcum Smeectis Steatitis. L. in the fine porcelain.
3. SWEDISH SOAPROCK.							
Flat cakes	soft	light	polished	RUDDY	very fatty	Sweden	Talcum Smeectis Lamellosum. L. cleaning woollen cloths.
4. GERMAN SOAPROCK.							
In small lumps	tender	light	rugged	WHITE SPOTTED WITH RED	soft	Hartz forest	Talcum Smeectis Subdiaphanum. L. cleaning woollen cloths.



FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
5. GREY PLATED SOAPROCK.							Talcum Lamellare. L.
Flat cakes	brittle	heavy	smooth	GREYISH	fatty	Sweden	for marking.
6. BLACK PLATED SOAPROCK.							Talcum Corneum. L.
In thick cakes	very hard	very heavy	smooth and polished	BLACK	oily	Germany	for marking.
7. LEATHER SOAPROCK.							Talcum Coriaceum. L.
In thin cakes	soft	light	uneven	PALE BROWN	fatty	Sweden	
8. ROSE SOAPROCK.							Talcum Carneum. L.
Rude lumps	tender	heavy	raised in convex flakes	ROSE-CO- LOUR	very soft	Sweden	cleaning wool.



<p>9. GREEN SOAPROCK.</p> <p>Uneven lumps</p>	<p>soft</p>	<p>dufty</p>	<p>DEEP GREEN</p>	<p>dry</p>	<p>Germany</p>	<p>Talcum Viridans. L.</p>
<p>10. RED SOAPROCK.</p> <p>Vast masses</p>	<p>soft</p>	<p>uneven</p>	<p>DULL RED</p>	<p>fatty</p>	<p>England</p>	<p>Talcum Rubrica. L.</p>
<p>11. WHITE SOAPROCK.</p> <p>Flat masses</p>	<p>soft</p>	<p>dufty</p>	<p>WHITISH</p>	<p>fatty</p>	<p>Switzerland</p>	<p>Talcum Lithomarga. L.</p>
<p>12. FRENCH SOAPROCK.</p> <p>FRENCH CHALK.</p> <p>In great flattened lumps</p>	<p>hard</p>	<p>smooth</p>	<p>GREENISH WHITE</p>	<p>very fatty</p>	<p>France</p>	<p>Le Talc Verd de Briancon. B.</p>
<p>13. SPOTTED SOAPROCK.</p> <p>Small flattened lumps</p>	<p>soft</p>	<p>uneven</p>	<p>GREY AND GREEN</p>	<p>fatty</p>	<p>France</p>	<p>Le Talc Verd Marbré. B.</p>

for marking.

for marking.

for cleaning cloaths.



T A L C.



G E N U S V.

P O T S T O N E.

O L L A R I S.

Composed of broad, narrow, and uneven Flakes, mixed irregularly together.



FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. SOAPY POTSTONE.							
Great masses	hard	very heavy	uneven	MOTTLED GREY AND GREEN	fatty	Sweden	Pierre Ollaire, W. for vessels to bear the fire: it hardens to a stone in burning.
2. TENDER POTSTONE.							
Rude masses	soft	heavy	irregular	GREY AND RUDDY	very fatty	Switzerland	Pierre de Côme, B. for pots to bear the fire.
3. COARSE POTSTONE.							
Large masses	hard	heavy	scaly	GREY AND BLACK	dry and harsh	Germany	Pierre Ollaire à gros grains, B. for furnaces.



T A L C.

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G E N U S VI.

C O L U B R I N E.

C O L U B R I N U S.

Composed of small, flat, thick, even, and close-connected Flakes.



FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. SOFT COLUBRINE.							
In flat maffes	foft	light	uneven	OLIVE-CO- LOURED	very fatty	Salberg	for ornaments.  La Colubrine tendre. B.
2. HARD COLUBRINE.							
Rude maffes	very hard	heavy	rugged	IRON-GREY	fatty	Germany	for furnaces.  La Colubrine dure. B.
3. LOOSE COLUBRINE.							
Flat maffes	hard	heavy	flaky	GREENISH	fatty	Salberg	for furnaces.  Lapis Colubrinus Lamellofus. B.



**A**LL the Colubrines cut easily, but will take no polish.

If it were not for the last Species, it would have been hard to know the Colubrines were Talcs: but here we evidently see the plates; though they will not separate.

In this, and in the Soaprocks, and the Potstones, all is Talc, though mixed and crushed together. These afford instances of Talc fouled with Earth; but still 'tis talcy Earth; and perhaps unformed Talc: and in the Ollaris, in particular, we see it in the most mixed state of all; with unformed earthy Talc, and talcy Fibres.



T A L C.

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G E N U S VII.

S E R P E N T I N E.

S E R P E N T I N U S.

Composed of Plates connected in small lumps, and mixed with unformed Talc.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
<p>5</p> <p>1. DARK SERPENTINE.</p>							
In great lumps	very hard	very heavy	rugged	MARbled OF GREEN AND BLACK	dry	Finland	Talcum Serpentinus, L. for marble mortars.
<p>2. BRIGHT SERPENTINE.</p>							
In vast masses	hard	heavy	half-polished	MARbled OF DARK GREEN AND WHITE	fatty	Germany	La Serpentine demi transparent, B. for ornaments.
<p>3. THREADY SERPENTINE. NEPHRITIC STONE.</p>							
In large lumps	hard	very heavy	bright	LIGHT GREEN	fatty	America	Talcum Nephriticus, L. in medicine, for the gravel.
<p>4. BLACK SERPENTINE. TOUCHSTONE.</p>							
In vast rude masses	hard	heavy	smooth	BLACK	fatty	Silesia	Lapis Metallorum, W. for trying metals.



## NATIVE FOSSILS.

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 CLASS II.

## SELENITE.

## SELENITES.

Composed of flexible, but not elastic Plates.

**S**ELENITE is softer than Spar; less weighty, and somewhat less transparent.

Its Plates break into Rhombs; and when it crystallizes free and pure, this is its natural and original form.

We find it transparent, of various Figures; but composed all of united Rhombs: and when its concretion has been interrupted, we see it in the forms of granulated, fibrous, or scaly masses, and call them *Gypsa*, or *Plaster Stones*.

The substance is the same in all; for Selenite, like Spar, is but one thing, one substance; and whether we find it pure in beds of clay, or coating walls, or hanging in Icicles from the roofs of caverns; whether compact as marble, or loose as powder, still the substance is one: it proves the same on the severest trials; and when carefully disunited, and

viewed before the microscope, its particles are all plated, watery, and rhombic.

Selenite therefore is one thing; one substance, in all its variety of forms: and 'tis but idle to divide its different appearances under the affected double terms of Species and Varieties. The laws of Botany cannot be justly extended to Fossils; because they are not organized bodies, or raised from seeds: in all its forms this is one thing; and the whole purpose here is to lay down its different appearances, for their disposition in a cabinet.

This Treatise is written for the arrangement of one great Collection; if it serves others, so much the better; but that is all its purpose.

We find even Arsenic in Selenites; nor did I ever see one without iron; and this, as more or less, causes a variety of forms: but still 'tis the one substance Selenite thus alter'd; and thrown, by means we know, into these appearances; and the term Species belongs to none of them: we use it for convenience of distinction; but must not dispute about its propriety.



## ORIGIN of SELENITE.

**S**ELENITE is composed of an Alkaline Earth, saturated with the Acid of Vitriol.

We know this: for we can make something very like it by art this way: 'tis pity we cannot do this exactly. We have its nature in these artificial bodies, but not its form. We can produce a Salt with all the properties of Selenite; and this, among the rest, that when well made, we can't again dissolve it: but I have never succeeded so far as to get this Salt in its Rhombic form: we have it in striated masses, and in clustered flakes; and in the same forms we have also natural Selenite. Art imitates the more imperfect and disturbed crystalizations of nature in this substance; and 'tis as much as we can expect from it; we cannot give the pure and perfect forms of nature.

Selenite will not strike fire with steel; for 'tis so soft, we crush it between the fingers: it will not ferment with acids, for 'tis a neutral Body in its nature; an earth capable of fermenting with them, but already saturated. Some kinds effervesce slightly, but 'tis from a mixture of Spar; for nature makes her saturations accurately. Cronstedt most justly talks of iron in some kinds; I find it, as already said, in all; nor is there any end of the variety of other mixtures.

Selenite falls into powder by a very slight heat: and, as 'tis said, may be dissolved and recrystallized. I hope it is so; but have not found the way to perfect it in my own trials. This powder hardens with water; but without heat, or what we call, flaking,

'Tis strange Wallerius should suppose the Selenite Bodies not to break into Rhombs: 'tis constant, and 'tis of their character; they differ in this from Talcs, whose flakes will never break into any form, tho' they will split for ever. They are simple; and are the very idea of mathematical extension, breadth without thickness.



S E L E N I T E S.



O R D E R I.

S E L E N I T E.

S E L E N I T E S R H O M B I C U S.

In form of simple or united Rhombs, variously connected.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. CLEAR SELENITE. Perfect clear Rhomb of ten sides	tender	light	polish'd	PELLUCID	clean edged	Oxfordshire, in clay	Natrum Selenites. L. for grottos.
2. WHITE SELENITE. Thick, rude Rhomb of ten sides.	hard	light	rugged	MILKY	scaly edged	Northamp- tonshire, in clay pits	Selenites Albus. W. a medicine for fluxes.
3. YELLOW SELENITE. A clean thin Rhomb of ten sides	very soft	heavy	polish'd	PALE YELLOW	shattery	Leicester- shire	Selenites Flavus. W. for grottos.
4. MANY COLOUR'D SELENITE. A prism of fourteen sides	hard	heavy	rugged	WHITISH BROWN, WITH BLUE AND RUDDY VEINS	crackly, feather'd in the centre	Northamp- tonshire, in clay	Natrum Flexile. L. curiosity.



5. BASALTINE SELENITE.

A prism of  
six sides,  
with two  
pyramids

soft and  
tender

heavy

polished

DUSKY  
BROWN

full of  
cracks

Norway

curiosity.

Natrum  
Basaltinum.  
P.

6. WEDGE SELENITE.

An arrow  
head, form'd  
of two  
wedges

hard

light

glossy

WHITISH

sharp  
edged

France

for scagliola.

7. COMPLEX SELENITE.

A flat  
plate of  
Rhombs and  
Wedges

tender

heavy

polished

COLOUR-  
LESS

variously  
cracked

Greenwich

for grottos.

Selenites  
Compositus.

8. GOLDEN SELENITE.

A cluster  
of Wedges

soft

heavy

glossy

PALE  
YELLOW

shattery

France

for scagliola.

Drusa Gypsea  
Flava.

S E L E N I T E S.

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O R D E R II.

P L A I S T E R S E L E N I T E .

G Y P S U M .

Composed of numerous small Scales, irregularly laid together.



FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. WHITE PLASTER STONE.							Gypsum Micaceum Cronstedt.
Masses of thick scales.	crumbly	very heavy.	rough and coarse	DULL WHITE	hard particles	Germany	stucco work.
2. GREY PLASTER STONE.							Gypsum Micaceum Griseum Cronstedt.
Masses of small scales	compact	heavy	rugged	SILVERY GREY	tender particles	Norway	stucco work.
3. YELLOW PLASTER STONE.							Gypsum Micaceum Flavum Cronstedt.
Masses of thick scales	tender	heavy	uneven	YELLOWISH	small, soft par- ticles	France	stucco work.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
4. RUDDY PLAISTER STONE. Vast masses of small scales	soft	very heavy	rugged	PALE RED	friable	Yorkshire	stucco work.  Gypsum Rubrum.
5. GLOSSY PLAISTER STONE. Bright masses of wav'd scales	friable	heavy	uneven	CLEAR	splitting	Germany	stucco work.  Gypsum Pellucidum. W.
6. POWDER PLAISTER STONE. White dust	soft	light	granulate	WHITE	dry	Saxony	stucco work.  Terra Gypsea Cristallina. W.



S E L E N I T E S.

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O R D E R III.

T H R E A D Y S E L E N I T E.

G Y P S U M S T R I A T U M.

Composed of long threads, laid one by another.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. WHITE ENGLISH TALC. Broad, fibrous masses	compact	very heavy	even	BRIGHT, BUT WHITISH	splits perpendi- cularly	Yorkshire	Gypsum Striatum. W. for cleaning lace and plate.
2. CLEAR In small masses	tender	heavy	polished	COLOUR, LESS	wavy	Sweden	Gypsum Fibrosum Cronstedt.
3. GREENISH Oblong masses	brittle	very heavy	rugged	PALE GREENISH WHITE	flaky	Germany	Le Gypse Sciffile. W.
4. POLISHED Short, small masses	tough	heavy	smooth	PALE OLIVE- COLOUR'D	compact	Norway	Le Gypse Amianthe. W.
5. YELLOW Small clusters	tender	light	bright	PALE YELLOW	silice easily	Sweden	Gypsum Capillare Cronstedt.



SELENIATES.

ORDER IV.

RADIATED SELENITES.

GYPSUM RADIA TUM.

Formed into Rays, or Crests, or Ridges.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. STARRY SELENITE. CHEKAO.							Gypsum Stellatum.
Regular stars	very hard	very heavy	polish'd	PALE BROWN	lucid in the dark after insolation	In China, and Island of Shepey, on the waxen vein	* for china ware.
2. WHITE COCKSCOMB SELENITE. PETUNSE.							Gypsum Cristatum Cronstedt.
Crusts on balls of Spar.	very hard	heavy	coarse	WHITE	irregular	Germany	* for china ware.
3. RUDDY COCKSCOMB SELENITE.							Gypsum Cristatum Rubrum Cronstedt.
Rude lumps	hard	very heavy	smooth	REDDISH	jagged	Sweden	



4. BONONIAN SELENITE.

Roundish  
lumps

hard

very  
heavy

5. LIVER SELENITE.

Coarse, scaly  
lumps

very hard

heavy

6. BLACK SELENITE.

Small plated  
masses

hard

heavy

glossy

PALE  
BROWN

lucid after  
calcina-  
tion

Italy

Phosphorus  
Bononiensis.  
W.

ridg'd, and  
uneven

BROWNISH  
YELLOW

fulphure-  
ous smell  
when  
struck

Sweden

Lapis  
Hepaticus  
Cronstedt.

granulated

BLACK

very ful-  
phureous

Sweden

Hepaticus  
Niger  
Cronstedt.

\* These, and the Soap Rock, seem the great ingredients of the China Porcelane: and we have them all.

# S E L E N I T E S.

## ORDERE V. CURTAIN'D SELENITE.

SELENITES STIRIATA.

Coating the cracks of plaister pits, in form of folded curtains.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. WHITE CURTAIN'D SELENITE.	hard	heavy	wav'd, and glossy	PURE WHITE	shattery	Italy	Stalactites Gipseus Albus Cronstedt. as alabaster.
2. YELLOW CURTAIN'D SELENITE.	hard	heavy	polish'd	BROWNISH YELLOW	shattery	France	Stalactites Gypseus Flavus Cronstedt. as alabaster.



# S E L E N I T E S.

## O R D E R VI.

### S T A L A C T I C A L S E L E N I T E.

#### S E L E N I T E S S T A L A C T I T I U S.

Hanging like Icicles from roofs of hollows.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. CLEAR STALACTICAL SELENITE.							
Short cones	tender	heavy	rumpled, but glossy	COLOUR- LESS	brittle	Italy	Gypsum Spatofum Stalactium Cronstedt.
2. YELLOW STALACTICAL SELENITE.							
Long cones	hard	heavy	circled	YELLOWISH	very brittle	Sicily	Gypsum Spatofum Stalactium Flavum Cronstedt.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
3. WHITE STALACTICAL SELENITE. Rude lumps and rifings	tender	heavy	botryoide	WHITE	brittle	Sweden	Gypsum Sparosum Stalactum Album Cronstedt.

# S E L E N I T E S.

## O R D E R VII.

### S T O N Y S E L E N I T E S.

#### S E L E N I T E S L A P I D E Æ.

In hard, solid, shapeless masses.



FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. WHITE STONY SELENITE. WHITE ALABASTER.	Thick masses   tender	heavy	uneven	PURE WHITE	uniform texture	Ægypt	Gypsum Solidum. W.
2. BROWN STONY SELENITE.	Rude lumps   hard	heavy	scaly	PALE BROWN	shattery	Sicily	Alabastrum Opacum Cronstedt.
3. YELLOW STONY SELENITE.	Flat cakes   hard	very heavy	even	DULL YELLOW	shattery	Greece	Alabastrum Flavum Cronstedt.
4. AMBER STONY SELENITE.	Great masses   hard	heavy	wav'd	AMBER- COLOUR'D	compact	Ægypt and Persia	Alabastrum Flavum Diaphanum Cronstedt.
5. GREEN STONY SELENITE. NEPHRITIC STONE.	Great masses   hard	heavy	uneven	PALE GREEN, CLOUDED	greasy	America	Pierre Nephritique. W.

a supposed medicine for the gravel.

**F**ROM Selenite we naturally advance to Spar and enter upon one of the most intricate, and varied classes of the mineral kingdom.

Some general reflection ought to introduce a subject so important: and under an instance so commanding, and so explanatory of the rest, it may be proper to cast an eye upon the general course of nature, in the Fossil world.

When we have found the real origin of this pure Stone, we shall be led to that of half the concretes that we are about to examine: and when we have seen how this one substance assumes its various forms and colours, we shall judge easily of the rest. 'Tis not impossible to trace this accurately; nor is anything required to the undertaking but attention to the neighbouring Fossils where it is found; and to the beds thro' which the level of the country, and construction of its strata will shew it must have run before concretion. This observation, carefully made, will give the Philosophic History of its varied appearances; and lay them regularly down in a true natural method: but first we are to understand its origin; and its place in the great chain of beings.



O F T H E

## O R I G I N \* o f S P A R.

**T**H E Series of Fossils make one great circle; for ever returning into itself.

There are a few primitive bodies; Chalk, Clay, Bitumen, Talc, and the Mineral Acid.

These, variously mixed, form many different compound Fossils: which mingling, in some places, farther with one another, give decompositions.

These (in other places) give up their several primitives again to water: which delivers them pure in some other parts; ready to form mixt and compound bodies again.

To trace them thro' these combinations, and to their natural analysis again, is the whole business of the student in this science: for here is no distinction but by mixture: no origin from egg, or seed.

A great deal of pure Clay mixed with a little quantity of various Stones, forms the different Clays.

And a great deal of Stone with a little of the Clays, forms the various species of Stones.

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\* Published separately, July 1772, as a Specimen of a method of Fossils.

An instance of this course of nature appears in the philosophic History of Spar.

1. The primitives, as we have seen, are,

*Water, Bitumen, Chalk, Clay, Talc, and Mineral Acid:*

To these, the operations of the air, and fire give great powers of acting. We thus find

2. *Heavy Vapours*, form'd of air, and much water. These, pervading all things,

3. Meet the Mineral Acid <sup>1</sup>, and uniting with it; if they run clear to the surface, afford Medicinal Springs; but

4. Thus united, they may fall upon Bitumen: this is no-where more frequent than in Limestone Rocks; and often stands in puddles, in their natural hollows <sup>2</sup>.

5. By this mixture, uniting in its course, is form'd a real, tho' a fluid Sulphur: for Sulphur is nothing else; nor can be form'd by any other means <sup>3</sup>.

6. This Sulphur, not yet concreted, passes in its

<sup>1</sup> The Electric Æther of the under world; present every where, but only seen concentrated, or in its mixtures. It affects some things, Bitumen most: and avoids others.

<sup>2</sup> At Naples; in the Venetian Territories; and in Persia, this is very common.

<sup>3</sup> Absolute Sulphur may be made by art with ease and certainty this way. The Acid of Vitriol, with any thing inflammable, affords it.



liquid form; thro' the pores of the Limestone; dissolving part of its purer Chalk as it goes <sup>4</sup>.

7. Water thus saturated with the principles of Sulphur, and with Chalk, keeps on its gradual course horizontally thro' the same Lime Rock, till it meets a fissure; a perpendicular crack, or opening; dividing one part of the rock from another. Here it ouzes forth: and meeting with a lighter air, hangs; and evaporates slowly.

8. Slow evaporation, and perfect rest, are the requisites of crystallization. The Sulphur and pure Chalk thus united, form one solid body; which crystallizing gradually, appears in regular rhomboidal particles: and is the substance we call Spar <sup>5</sup>.

<sup>4</sup> Limestone is only coloured, hardened Chalk; and Marble is the same. Marble is a purer Limestone, and Limestone a coarser Marble.

<sup>5</sup> Spar supposed to be one thing, is therefore a mix'd body, and so are the purest Salts. We can make a substance of the nature of Spar, by crystallizing the lixivium of Lime and Sulphur.

## NATIVE FOSSILS.

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 CLASS III.

## SPAR.

## SPATUM.

A pure Fossil ; composed of Brittle Rhombs.

**S**PAR is known from Talc by its want of elasticity ;

—from Selenite by its want of flexibility ;

—from Crystal by its dullness, and by fermenting with Acids.

It is heavier than any of the three other pellucid Fossils ; and is known from all bodies in the world (when pure enough to be seen through) by its doubling lines laid under ; and view'd through it.

This last property has been supposed peculiar to that species of Spar call'd Island Crystal : and the greatest writers, Linnæus, Wallerius, Cronstedt, and the long *et cætera*, have separated that body from the pure Rhombic Spar ; which they supposed not to have the double refraction. But this power resides in all Spar I have examined : and is of its nature : as it arises from the internal construction of the body, which is made up of smaller Rhombs, apply'd one to another.

The



The very atoms of Spar are Rhombic; and those smallest pieces into which it may be separated by gentle Acids, without solution, apply'd to the microscope over a line proportionably fine, have the same power.

No body has this construction except Spar; therefore no other natural or artificial substance has this power of double refraction. Even Sir Isaac Newton has said, Crystal has something of this power; in vain: for no authority can stand against the testimony of the senses. All different mediums vary in refraction; but this peculiar power resides only in a pellucid body formed of connected Rhombs.

The state of refraction in the pellucid natural bodies is this,

1. Talc in thick masses elevates the line.
2. Selenite waves it.
3. Crystal distorts it.
4. Spar gives it double.

All Spar does this, even that which takes the form of Crystal, in Pyramids, and Columns: therefore even the variously angulated forms of Spar are composed of Rhombs; and the construction of Spar, and of Crystal, are perfectly different, even while their forms are the same.

Spar is seldom found original, and free: a few pure Rhombs;

Rhombs; and two Columns, double pointed, which were dug in the Hartz Forest; are all I have of it.

Nature has mixed its particles among the matter of the Marbles and Limestones; from whence it is washed forth by the pervading water, and left slowly by it, in their cracks and fissures; where it assumes these various forms:

1. Pure Rhombs of a larger size.
2. Rude masses, form'd of coarse connected Rhombs.
3. Plates composed of connected Rhombs.
4. Columnar, Pyramidal, and Cubic Figures, fix'd upon the surface of these rude masses.

In this latter case the rude mass continues uncolour'd, and is the Root; and the Columnar or Pyramidal Figures rise from it frequently yellow, often of other colours: these cut into a kind of Gems, but still have the double refraction equally with that part we call the Root.

5. Icicles and Dropstones.

That the Spar form'd in fissures of rocks, is thus wash'd out of the Limestone itself is certain:

Because none but Limestone Rocks have Spar in their fissures; Rocks of a crystalline matter, or form'd of vitrifiable Stone, have Crystal; never Spar in their cracks.



Linnæus wonders at the nature of that force which split the Rocks into these cracks: but probably the cause is very familiar; they were formed moist, and crack'd in drying.

Spar grows continually; for wheresoever there is a crack in a Limestone Rock, new, or old; Spar always fills it; and over-runs the surface.

Letters cut hollow in a living Rock of Limestone, fill up, in a course of years, with Spar; and what were made in Creux are found in Relief. This has been seen in Gothland by the eminent Swede; and in the grotto of Antiparos by Tournefort. The very time may be determined by the dates, which are often a part of the inscription; but it is always long. The Spar stands higher as the time is more distant: and has been seen in some places a quarter of an inch above the level of the surface.

If there could want a proof of the continual growth of Spar, the Stalactites would shew it; and the incrustations, in what are called our petrifying springs; but that is a fouler sort: there is in Norway a pyramid of Spar two inches long, which was once mine; in which two branches of the solid Heath moss, or Lichen, are perfectly embodied.

It has been thought the Spar in cracks of Rocks was brought from elsewhere by water; or was and is originally in all water: the latter is the opinion of Linnæus;

Linnæus; Henkell maintains the former. But if either were the case, Spar would be sometimes found in Vitrescent Rocks, and Crystal in those of Limestone; which observation denies.

Spar they say will be formed where water can be retain'd; but indeed also where it cannot; 'tis enough that it ouzes slowly: nay, not water alone dissolves Spar; [but it can be retain'd in vapour. I have from Cornwall incrustations of true Stalactite, form'd in the pipes of fire engines in the mines, at heights to which the water never ascends, by many feet; but only vapour.

Mundick is also thus a creature of the air, in many places. I have trigonal pyramids of Spar, which hung from the top of the Bauman's Cave, in the Hartz, covered with Cubic Mundick; there is none in the Spar itself; and from the particular circumstances of the specimen, water could not have lodg'd upon it, only vapour.

Spar is one thing, of one weight, one hardness, and when pure can never be mistaken for any other Fossil. It is liable to have other bodies mixt with it; and to be altered in its condition by that mixture: but 'tis itself the same. Wallerius distinguishes three degrees of hardness in this Fossil; but they are owing to those mixtures; the least hard is the true condition of Spar; the other degrees arise from iron, or other additions.



It is the opinion of Linnæus, that Spar owes its angulated form to Sea Salt; and the Crystals to other Salts: but there is no warrant in nature for this judgement. Salts are acrid, and dissolve in water. These Fossils have neither of those qualities: and who shall tell us that the property of forming itself into regularly angulated Figures is peculiar to Salts? We have no authority to believe it is wanting in Crystal, and Spar; and we have the evidence of our senses that they have it.

The ingenious and ingenuous Croustedt well observes, these Figures ought not to be ascribed to Salts, till the presence of such Salts can be prov'd in them.

The calcareous nature of Spar is of its essence; and no form, nor all the other characters in the world, could constitute a thing a Spar, that wanted this. They all ferment with Acids, and they burn to Lime: nor is this latter quality equivocal, as some would think, because by the fire of a great burning glass, Spar vitrifies. This is not the fire, when we speak of Lime; and it can be a test of nothing; because all things vitrify before it: that is the extream force of fire: and the ultimate effect of fire on all bodies is vitrification.

Linnæus says, the Spar he calls *Natro-spatosum*, scarce does effervesce with Acids: and it may be added, that the particles of that Spar are scarcely at all Rhombic: Spar and Crystal are mixt in those bodies;

and they have mixt qualities ; but still as there is some Spar, there is some Effervescence.

'Tis vain to give the forms of Spar to Natrum; for we not only find no Natrum there, but different Spars have forms of different Salts; and the great patron of the Salt System allows, that some of them affect the various angulated Figures of Alum, Sea Salt, Vitriol, and the rest. 'Tis true, they resemble those forms; but they have not those forms exactly: nor is either of these, or any other Salt whatever, to be found existing in any of them.

But whither will not the wind of Theory blow even the steadiest judgements: the foremost of the writers, who favour this System, because there are in Spars certain forms that do not agree with those of any known Salt, fancies for the formation of these that there exist Salts, not otherwise known to us, but by this operation. When Theory can reach this height, it may do what it pleases: to create Causes, because we see Effects that seem to us to require them, is to make all things easy; and at the cheapest rate.

If we can ever bring Spar, after solution, to recrystallize, as Salt; we shall see all things explained in this particular. 'Tis what I have try'd four years, with poor success; and I have now requested the ablest chymist that we have, to join with me in the attempt. What may arise under his experienced hand, I know not: all I have found is, that the swifter the fluid is eva-



porated, the coarser is the matter left behind; and the more length of time is given, the nearer it approaches to a promise of Crystals.

I think when this shall be accomplish'd, we shall find all Spar to be but one thing; differing only according to the other matters mixed with it. 'Tis said, the Selenite powder'd and mixt in water, affords Crystals; and Kahler gives the authority of an eminent metallurgist for it: with me neither has this succeeded yet: but I have no despair; and tho' it never should succeed with me, it may with others: when that is seen, the other, more important as it is, need not be supposed impossible.

Nothing is more familiar than the production of what it is the custom to call, Selenitical Salts; Urine affords them; and some preparations of Sulphur; but to recrystallize Selenite is, to produce, from a clear fluid, pellucid dodecahedral Rhombs, flexile, not elastic, and not soluble again in water: and he who shall effect this, need not despair of recrystallizing also Spar.

The Salts in Urine that has stood long come nearer the nature of Fossils than any thing we know; and Tartar, form'd from Wine, is very difficult of solution: yet both these may be melted in pure water. The Salt produced by slow crystalization from a Lixivium of Lime and Sulphur, comes nearest of all to Spar; but still it is but an approach; and not a sameness:



ness : as he who is well acquainted with all the qualities of the vitriolated Tartar will perceive ; nor do I conceive Henkel's receipt, form'd on the same foundation, would go any farther : but till men speak plain, 'tis vain to war against their buried meaning.

In fine the formation of Spar is yet a subject of enquiry : its atoms are all Spar ; each particle into which we can without violence divide it, is the same in all respects as the whole : and as the Fossil world admits no generation, or birth, by egg, or seed, it seems most probable that all the variety of forms in which we see this Protean Mineral, are owing to no cause beside the arrangement of Rhombs into as many forms as they are capable of producing. It fills the cracks of its own rocks : and of no other : for Crystal Columns rise from crystalline Rocks ; and from Metallic Masses, fractur'd, grow Pyritæ ; each separated from the great mixt body we see split ; and each form'd into Figures by its own laws, without the intervention of Salt, or other matter.

We find hollow Crystals, and we have hollow Pyramids of Spar ; but 'tis a rash thought, tho' of a great man, to imagine that a Crystal of Salt was first form'd in these cases ; and when the stony coat was finished over, it melted away again : this is imagination : but there is not a hollow Stalactite that may not shew the senses, and convince the reason, that this shell of Spar, or Crystal, may be form'd without a solid nucleus.



There are no entire Rocks of Spar; and they who thought they had seen such of Crystal, perhaps mistook pure Ice for them. Both Spar and Crystal rise in general from fowl Stones; and they who thought Ice grew to them in time, were scarce more pardonable than such as took Ice for them. Scheukzer has seen the difficulty of accounting for their forms, and joined the lamentation of Philosophers upon that subject; for the Salt System was not then in being: but the old Pliny has not only lamented this difficulty, but assigned its cause; and this a cause to overthrow that system utterly: it is, that tho' the Figures be all regular, they are not all alike; or all resolvable into the same laws.

'Tis an invidious office, and unpleasing, to dwell upon the errors of those who wrote before; but these are so receiv'd, and so establish'd, that there is no other way to truth.

Wallerius says, that Spar is composed of Rhombic and Pyramidal particles: and therefore breaks into both these forms. It is unwillingly I dissent in a few particulars, from an author with whom reason and observation command me to agree in a great many: but this is a doctrine which strikes at the root of all accurate knowledge in respect of this body.

By this account Spar would be two things, not one: its atoms would have two Figures; and we should lose the great distinction by which it is kept  
separate



separate from all other bodies. I have examined this point with all possible attention; and find the pyramidal Figures of Spar, whether in greater or smaller pieces, to be a secondary form; composed always of Rhombs: but the Rhombic Figure never to have any form in its constituent parts beside its own. The Pyramids, great or small, separate into Rhombs; the Rhombs never into Pyramids. The true way of dividing Spar is, by an Acid, carefully manag'd; for the parts are always separated, before they are dissolved.

It is a singular and a just observation of the same author, that no pentagonal Spar has ever been found; tho' angles in most other numbers are frequent; but this is not to be attributed with him, to an imaginary Salt, Alcaline, and Muriatic; it rests upon a much more solid base: which is, that the particular Figure of the Rhombs of Spar, admit the constructing any other angulated form, only not pentagonal.

It has been said, that Island Crystal shines in the dark after it has been calcin'd in manner of the Bolonian Stone; but this is not particular to that Species: it is the quality of all Spar, as Spar; only there requires great nicety in the calcination: perhaps Selenite also has this power. Linnæus refers the Bolonian Stone to Spars: to me it has appear'd rather a Selenite; and of all bodies in nature, most of kin to that species of Selenite we call the Star, upon the waxen vein. I have therefore retain'd it in that place, till more of this scarce Fossil comes in my way for trial: if  
it



it prove Spar, 'tis easily removed into that Class ; and thus, and only thus, we can arrive at truth ; after a thousand errors.

That the Hog Spar affords Flowers on sublimation, has been urged as a great proof of its containing Salts of some kind or other ; known or unknown : but surely this property is more naturally resolved into another source. All Bitumens yield flowers on sublimation ; and we have the testimony of our senses to the presence of a Bitumen in the Lapis Suillus : it stinks of it. Nay more, there is a smell of Sulphur in all Spar, when calcined : Henkel and Wallerius, as well as I, have found it ; and if we could give way to any thought of secondary forms, in a Fossil whose construction appears perfectly homogeneous, and simple, my sense of it would be, not to seek them in imaginary Salts, but real Sulphur.

We see the way art imitates it best, is by the Crystals of a liquor in which Lime and Sulphur have been boil'd. Sulphur is thus disclosed on the calcining of Spar ; and for the other ingredient, Lime, we cannot be at a loss ; since it has been observed, no Spar is ever produced in cracks of any rocks, except those of Limestone : nay, and what may strengthen this opinion, the Lime of Spar is weaker than that of Limestone, which, a little Sulphur may cause. All this, is not conjecture ; and is delivered as such, and no other ; but yet it rests on the testimonies of the senses ; not on the flights of the imagination : and it is by conjecture,

ture, in these dark and difficult researches, we must arrive at truth.

I claim no better authority for many of the particular observations here, than for this general one; they are indeed all founded on examination, and experiments, now made on the occasion; but they are examinations and experiments made only on the bodies in my own scanty store: I invite, I solicit, and entreat with my best earnestness, others to repeat them on their own. If they answer as in mine, the doctrines are establish'd; if they differ, there is no one in the world to whom that truth will be more welcome than to myself. To equivocate about an error, is pitiful; to attempt to justify it, is disingenuous: no man should be ashamed of setting right his own mistakes (especially in matters where mistakes are unavoidable) whether by his own or others observation. With how many hundred errors did the *Species Plantarum* make at its first appearance; how many of them have been rectify'd; and how many yet remain to be set right? Yet no one ever blamed Linnæus for his first conjectures; nor has the world seen any other book of Science of equal value.

Such errors are the children of imperfect information; and must be found in all who attempt to write for general utility.

Let others therefore freely repeat these my experiments, and add more of their own; and with  
an



an honest freedom tell the result of all. My single attention can only make a few experiments, where true knowledge demands a thousand: but the result of different trials will bring forth truth.

It never was more needed in Philosophy than in the part before us; for with all the plausibility of system, we cannot but perceive upon this free and fair enquiry, that the Student in Fossils has yet to work upon a chaos: and that the paths into a better light, are stop'd and clos'd up utterly: not by ignorance; but what is much worse, by authenticated error; authenticated even by greatest names. We must unwind this Charm, if ever we hope to gain the right clue to lead us thro' the labyrinth of nature: we must break the fated Talisman; and all the seemingly impregnable structures will vanish: the ground will be clear before us; and if we lose ourselves in the open way, 'tis easy to be set right again.

SPAR form'd by nature, as above related, may either concrete in its pure state as soon as made; or it may pass while yet fluid, thro' various strata of Earthy, Saline, Mineral, and other matter, and receive great changes both in form and colour from them: it may appear to us therefore, according to these circumstances, either in its own pure state of a colourless Rhomb; or foul'd by earths; or ting'd by metals; or plated, by an admixture of Talc; or render'd cubic by the natrane Marle; and those cubes stain'd to a mimickry of Gems by metals;

or it may be shap'd into Polygons by an aluminous earth ;

or thrown into Pyramids, with or without Columns, by the Salts of Mineral Waters :

Or from the mere nature of its concretion, it may appear as curtains spread upon a wall ;

as Icicles hanging from a roof ;

or Globules drop'd upon the floor ;

or as a coat upon mosses, or shells, or various other matters.

According to these accidents it may be thrown into a kind of method, under the terms Genus and Species, to great advantage. The obvious Characters giving an artificial method ; and the consideration of their Origin a natural one.



S P A R.



O R D E R I.

Retaining its natural Figure.

G E N U S I.

P U R E S P A R.

R H O M B I T E S.

Spar in form of Rhombs.

This is either pure as it concretes alone; or variously stain'd and colour'd by admixtures.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. SOFT SPAR.							
Small Rhombs	tender	very heavy	glossy	COLOUR- LESS.	soft	Hartz forest	Rhombites Pellucida. N.  a delicate, but weak lime.  Spatum Speculare Duplicans. L.
2. ICELAND SPAR.							
Large Rhombs	friable	heavy	glossy	COLOUR- LESS.	smooth	Iceland, Switzer- land, &c.	double refraction.
3. MILKY SPAR.							
Irregular Rhombs	brittle	very heavy	dull	MILKY WHITE	rugged	Derbyshire	lime.  Spatum Compactum. L.
4. TOPAZ SPAR.							
Connected	hard	very heavy	crystalline	PALE YELLOW	fatty	Germany	Spatum Speculare Flavescens. L.  false gem.



Spatum Rubrum  
Compactum.  
L.

Spatum Speculare  
Virescens.

Spatum Speculare  
Ceruleum.  
L.

Rhombites  
Opalina.  
N.

Spatum Compactum  
Flavescens,  
L.

5. GARNET SPAR.

Confus'd  
Rhombs

heavy

dull

STRONG  
RED.

uneven

Yorkshire

6. EMERALD SPAR.

Small  
Rhombs

heavy

bright

GREEN

soft to the  
touch

Germany

false gem.

7. SAPPHIRE SPAR.

United  
Rhombs

heavy

perfectly  
polished

PALE BLUE

dry

Germany

false gem.

8. OPALINE SPAR.

Connected  
Rhombs

very heavy

clouded

CHANGE-  
ABLE GREY

soft

Brazils

false gem.

9. YELLOW RHOMBIC SPAR.

Rude masses  
breaking in  
Rhombs.

heavy

scaly

DULL  
YELLOW

glimmer-  
ing.

Norway,  
England

lime.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
10. BLUE GREEN RHOMBIC SPAR.							
Rough Lumps	shattery	light	cracky	POOR GREEN	wavy	Germany	Spatum Compactum Virefcens, L.  lime.
11. ORANGE SPAR.							
Large Rhombs	shattery	heavy	crackled	ORANGE COLOUR	streaky	Germany	Rhombites Aurantiaca, N.  lime.
12. BROWN RHOMBIC SPAR.							
Great rude Lumps	shattery	heavy	irregular, flaky	LIGHT BROWN	harsh	England	Alumen Quartzosum, L.  lime.
13. BLACK RHOMBIC SPAR.							
Small con- nected Rhombs	very hard	very heavy	scaly	BLACKISH	hard	Cornwall	Le Spath Cubique Noiratre, W.  a tin ore



# S P A R.

## ORDER II.

Affecting the Figure of Talc.

### G E N U S I.

P L A T E D S P A R.

P A R O P S I S.

Spar formed into broad, flat Flakes.

Spar assumes this Figure after passing thro' beds of Talc.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. CLEAR FLAKY SPAR.							
Irregular, large flakes	brittle	light	glossy	COLOUR- LESS	unequal	Norway	for windows.  Spatum Fiffile. L.
2. WHITE FLAKY SPAR.							
Uneven cakes	very brittle	heavy	rough	MILKY	harsh	Sweden	lime.  Spatum Aqueum Hartenfe. W.
3. WAVY SPAR.							
Flat cakes	brittle	light	undulated	GREY	fatty	Denmark	lime.  Spatum Undatum. L.



S P A R.

ORDER III.

Affecting the Figures of the Crystals.

F L U O R E S.

G E N U S I.

T W O - P O I N T E D S P A R.

F L U O R B I C U S P I D A T U S.

Composed of two hexagonal Pyramids, with an intermediate hexagonal Column.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. SALBERG SPAR.							Fluor Bicuspidatus Diaphanus. W.
Small	soft	very heavy	polish'd	COLOUR- LESS	bitumi- nous	the Salberg hills in Asbestos	curiosity.
2. TAWNY SPAR.							Fluor Bicuspidatus Martialis.
Large	hard	heavy	uneven	YELLOWISH	bitumi- nous	the Swedish iron mines	curiosity.



S P A R.

ORDER III.

GENUS II.

CONNECTED SPAR.

FLUOR CONNEXUS.

Composed of two trigonal Pyramids, without any intermediate Columns.

L 2

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. DIAMOND SPAR.							Dent des Cochons a deux Pointes. W.
Small	hard	very heavy	polish'd	PERFECTLY CLEAR	smooth	Ramel- sberg	curiosity.

S P A R.

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O R D E R III.

G E N U S III.

C O L U M N A R S P A R.

F L U O R C O L U M N A R I S.

Composed of a Column, terminated by a Pyramid.



FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. HEXAGONAL SPAR.							
Long sprigs	tender	heavy	glossy	WHITISH	flaky	Derbyshire	curiosity.  Spatum Crystallifatum Hexangulare. W.
2. TETRAGONAL SPAR.							
Thick sprigs	hard	very heavy	flaky	YELLOWISH	rough	Yorkshire, lead mines	lime.  Fluor Columnaris Tetragonus. N.
3. TRIGONAL SPAR.							
Short sprigs	soft	heavy	scaly	RUDDY	uneven	forest of Dean	an iron ore.  Fluor Columnaris Trigonus.

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In form of an angulated Column, without a Pyramid.



FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR	QUALITIES.	PLACE.	USES.
1. SIX-SIDED SPAR.							
Coarse shoots	tender	heavy	rugged	BROWNISH	friable	Lancashire	lime. Spatum Prismaticum Hexangulare. W.
2. ABRUPT SPAR.							
A mass of short pieces.	hard	very heavy	smooth	RUDDY	confus'd together	Sweden	lime. * Spatum Prismaticum Truncatum. W.
3. MANY-SIDED SPAR.							
Short sprigs of fourteen fides	very hard	heavy	glossy	YELLOWISH	uneven	Derbyshire, lead mines	lime. Spatum Crystallifatum Tetradeca hedrum, W.

\* Wallerius saw this six sided: all my pieces are very ill determin'd in this article, breaking ill from the mass.

S P A R.

ORDER III.

GENUS V.

PYRAMIDAL SPAR.

FLUOR PYRAMIDALIS.

In form of Pyramids, without any Column\*.

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\* These are usually found in great clusters in the cliffs of Rocks of Limestone.



FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. POLYGONAL SPAR*.							
A broad base and fourteen sides	hard	heavy	polish'd	YELLOWISH	in great clusters	Cornwall	Fluor Pyramidalis Polygonus.  a flux for ores.
2. ELEVEN EDG'D SPAR.							
Short	tender	very heavy	glossy	RUDDY	cluster'd	iron mines in the Hartz	Spatum Pyramidale Endeca-hædrum. W.  an iron ore.
3. EIGHT SIDED SPAR.							
Irregular masses	very hard	heavy	polish'd in some parts	YELLOWISH	cluster'd	lead mines, Derbyshire	Spatum Pyramidale Octa-hædrum. W.  lime.

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\* This seems the other half of the preceding Species, but always separate.

S P A R.



O R D E R III.

G E N U S VI.

O B L I Q U E S P A R.

S U I L L U S.

In form of cluster'd Prisms, cut off obliquely at the top.



FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. BROWN OBLIQUE SPAR.							
Uneven clusters	tender	heavy	polished	DARK BROWN	stinking when rub'd	Germany, and Norway	a flux for ores.
2. RADIATED OBLIQUE SPAR.							
Uneven masses	soft	heavy	unequal	GREY	very stinking	Denmark	curiosity.
3. GLOBULAR OBLIQUE SPAR.							
Rounded masses	hard	heavy	botryoide	BRIGHT BROWN	fulphurous when struck	Norway	lime.

Lapis Suillus Prismaticus. W.

Lapis Suillus Radiatus. W.

Lapis Suillus Sphericus. W.

The Colour, as well as scent of these Spars, goes off in the fire: they require but a slight heat to render them as white and sweet as the other Spars: nor is it wonderful that sulphur should predominate so much in one kind, more than others. But 'tis singular, that the form of these Species is their own, and is indeed a certain Generic character; and that the abundant sulphur always attends it.

S P A R.



O R D E R IV.

C U B I C.

D R U S Æ.



FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. CLEAR CUBIC SPAR.							
In great complex clusters	soft	heavy	polished	COLOUR-LESS	multi-tudes mix'd together rudely	Derbyshire	Spatum Crystallizatum Cubicurn. W.
2. BROWN CUBIC SPAR.							
In thick clusters	hard	heavy	smooth	YELLOWISH BROWN	confus'd in clusters	Cornwall	Drusa Fulca. a flux for ores.
3. PURE WHITE CUBIC SPAR.							
Small and distinct	soft	very heavy	glossy	PERFECTLY WHITE	loose and free	Gloucestershire, in iron mines	Drusa Lactea. curiosity.
4. GREY CUBIC SPAR.							
Small clusters	hard	heavy	scaly	GREY	connected, but not confus'd	Germany, in iron rocks	Drusa Grisea. a flux.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
5. TAWNY CUBIC SPAR. In great con- fus'd masses	brittle	very heavy	rugged	YELLOWISH BROWN.	confus'd clusters	Forest of Dean	a flux.  Drufa Fulva.
6. PURPLE CUBIC SPAR. Small, and single	very hard	heavy	polish'd	AMETHY- STINE	distinct and perfect	Norway	curiosity.  Drufa Amethystina.
7. RED CUBIC SPAR. Separate cubes	hard	very heavy	glossy	FINE RED	pure and free	Spain	a gem.  Drufa Rubescens.
8. BLUE CUBIC SPAR. Loose clusters	tender	very heavy	polish'd	BRIGHT BLUE	connect- ed, not confus'd	North America, in copper mines	a false gem.  Drufa Cerulea.



9. DEEP-GREEN CUBIC SPAR.

Small clusters

soft

heavy

scaly

DEEP GREEN

small masses

Sweden

a flux.

Drusa Viridis.

10. PURPLE CUBIC SPAR.

Distinct

soft

heavy

flaky

DEEP PURPLE

single

Germany

a flux.

Drusa Violacea.

11. AQUA MARINE CUBIC SPAR.

Small clusters

tender

heavy

glossy

BLUE GREEN

distinct, tho' connected

Hartzforest

a flux for ores.

Drusa Caruleo Virens.

12. EMERALD CUBIC SPAR.

Large clusters

hard

very heavy

polished

PERFECT FINE GREEN

connected

Norberg

a flux for metals.

Drusa Smaragdina.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
13. LEMON CUBIC SPAR.							Drufa Pallefcens.
Vaft mafies	very foft	heavy	fcaly	PALE, BUT DEAD YELLOW	confufed	the Hartz	a flux for ores.
14. VIOLET CUBIC SPAR.							Drufa Violacea.
Diffinct, and fmall	hard	heavy	polifhed	VIOLET COLOUR'D	fcarce connected	Giloff	a falfe gem.
15. BLACK CUBIC SPAR.							Drufa Nigra.
In large clufers	very hard	very heavy	gloffly	BLACK	connect- ed, not confufed	France, where there is TIN	curiofity.
16. DEEP-GREY CUBIC SPAR.							Drufa Grifeofufca.
Small clufers	foft	heavy	polifhed	DEEP GREY	confufed	Cornwall	a flux.



FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
17. BLUE-GREY CUBIC SPAR.							
Small clusters	hard	very heavy	glossy, but flaky	BLUE GREY	connected	Sandfwaer, in Norway	a flux.  Drusa Subcarulea.
18. GARNET CUBIC SPAR.							
Loose and free	soft	heavy	polished	FINE RED	scarce connected	Alface	a false gem.  Drusa Rufa.
19. RUBY CUBIC SPAR.							
Small clusters	hard	very heavy	glossy	BRIGHT RED	almost free	Schemnitz	a false gem.  Drusa Rubea.

S P A R.

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O R D E R V.

A N D R O D A M A N D E S P A R.

A N D R O D A M A S.

Oblong, and affecting the paralleloiped Figure.



FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. WHITE ANDRODAMANDE.							
In large masses	very soft	heavy	polish'd	CHALKY	brittle	Sneeberg	lime. Androdama Alba.
2. YELLOW ANDRODAMANDE.							
Vast masses	tender	heavy	flaky	DULL YELLOW	shattery	America	lime. Spatum Pellucidum Flavescens. W.
3. TAWNY ANDRODAMANDE.							
Great masses	soft	very heavy	glossy	BROWNISH YELLOW	brittle	Anderasberg, in Germany	a good flux. Spatum Pellucidum Croceum. W.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
4. BLACK ANDRODAMANDE.							Spatum Pellucidum Nigricans. W.
Small clusters	hard	very heavy	glossy	DEEP BLACK	brittle	Coffelaer, in Saxony	a tin ore.
5. GREEN ANDRODAMANDE.							Androdamas Smaragdina Scheukz.
Small clusters	soft	heavy	polished	FINE GREEN	brittle	Switzerland	a false gem.
6. MARBLED ANDRODAMANDE.							Spatum Pellucidum Venosum. W.
Great masses	hard	very heavy	veiny	YELLOW, VEIN'D WITH RED AND BROWN	brittle	Switzerland	lime.



S P A R.



O R D E R VI.

R R E G U L A R S P A R S.

S P A T U M E F F L O R E S C E N S.

Uncertain in its Angles, but throwing itself into complex elegant Forms.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. ROSE SPAR.							
Large rose-like masses	tender	heavy	flaky	DEAD WHITE	hollow	Sweden, in lead mines	Spath Crystallifée en Roses. W. a flux.
2. HEDGE HOG SPAR.							
Small masses	hard	light	unequal	GREYISH	convex	Italy	Spati Echinorum Imperati. curiosity.
3. LAMELLATE SPAR.							
In vast flattened masses	hard	heavy	gill'd like mushroom rooms	WHITE	lightly convex	Germany	Spatum Plexum Tetradekahædram. W. lime.
4. BROKEN SPAR.							
Great lumps	very hard	heavy	smooth	BROWNISH	form'd of half octagons	Sweden	Spatum Dimidiatum. W. a flux.



FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
5. DECUMBENT GRAPE SPAR.							
Large clusters	soft	heavy	glossy, but rising in lumps	PALE BROWN	brittle	Sax Weiffels, in Norway	lime. Spatum Botryiticum. W.
6. CYLINDRIC SPAR.							
Great masses	soft	very heavy	glossy	PALE YELLOWISH	brittle	Bispberg, in Sweden	lime. Spatum Crystallifatum Cylindricum. W.
7. GLOBULAR SPAR.							
Round lumps	hard	heavy	smooth	BROWNISH	firm	Hartz forest	lime. Spatum Crystallifum Globosum. W.





FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. WHITE SAND SPAR.							
Rude masses	brittle	heavy	uneven, and irregular	GREYISH WHITE	composed of various sized particles	Twyebrook, in Sweden	a flux. Spatum Arenaceum Album. W.
2. YELLOW SAND SPAR.							
Small clumps	shattery	heavy	uneven	BROWNISH, YELLOW, AND GREY	confused, and coarse	Germany	a flux. Spatum Arenaceum Cinereum. W.
3. RUDDY SAND SPAR.							
Rough lumps	very hard	very heavy	uneven, and rough	DEEP RED	irregularly mixed	Forest of Dean	a flux. Spatum Arenaceum Rubrum. W.

S P A R.

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O R D E R VI.

G E N U S II.

G L A S S S P A R.

S P A T H U R A V I T R E A.

Glassy, firm, solid, and shapeless.



FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. CLEAR GLASS SPAR.							
Large nodules	very hard	heavy	uneven, but glossy	COLOUR- LESS	breaking into rude cubes	Stalberg	curiosity.  Spatum Lateribus Nitidis. W.
2. GREY GLASS SPAR.							
Rude Lumps	very hard	heavy	polish'd, but uneven	GREYISH WHITE	breaks in angulated frag- ments.	Hartz forest	curiosity.

Spatum  
Scintillans.  
L.

Spatum Lateribus  
Nitidis.  
W.

S P A R.          A R.

O R D E R VI.

G E N U S III.

P Y R I T I C S P A R.

S P A T H U R A P Y R I M I C H A.

Irregular, botryoide, and striated.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. RUDDY PYRITIC SPAR. Oblong lumps	brittle	very heavy	raised in bumps	RUDDY BROWN	fulphureous, when broken	Forest of Dean	Spatum Pyrimachum Rubrum. W. curiosity.

All the debased Spars have more or less of various mixtures in them, and therefore manifest their characters as Spar, less freely; but there is always more or less of the calcarious quality in them; and when broken, if not while whole, they shew somewhat of the cubic form in their particles.



S P A R.

                      
O R D E R VII.

C U R T A I N ' D S P A R.

S T I R I A.

Hanging over the walls of caverns in form of folded curtains.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. PURE CURTAIN'D SPAR.							
Vast sheets	brittle	heavy	polished, and glittering	COLOUR- LESS	flaky, when broken	Grotto of Antiparos	for slabs and or- naments.
2. YELLOW CURTAIN'D SPAR. ORIENTAL ALABASTER.							
Wav'd sheets	tender	heavy	polished, and undulated	PALE YELLOW, VARIOUSLY VEIN'D	breaks in freaky flakes	Ægypt; also Cornwall	for ornaments.

Stiria  
Decolor.

Stiria  
Flavescens.



3. PURPLE CURTAIN' D SPAR.  
ROOT OF AMETHYST.

Thick coats

hard

heavy

GREY,  
BLOTCH'D  
WITH PUR-  
PLE, OR  
OTHER  
COLOURS

breaks  
unevenly,  
and  
crackly

Derbyshire

for ornaments.

Stiria  
Amethystina.

4. WATER SPAR.

In crufts in  
tea-kettles

brittle

light

uneven,  
and  
rough

DIRTY  
GREY

striated

every where

none.

Stiria  
Fulca.

5. AERIAL SPAR.

Fine coats

hard

heavy

smooth,  
and  
even

BROWNISH  
YELLOW

striated,  
when  
broken

in the pipes  
of fire en-  
gines in the  
Cornish  
mines where  
only vapour  
comes

curiosity.

Stiria  
Atria.

S P A R.



O R D E R VIII.

S T A L A C T I T I C A L S P A R.

S T A L A C T I T E S.

In form of Icicles hanging from the roofs of caverns.



FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. WHITE STALACTITE.							
Long cones	brittle	heavy	uneven, but polished	WHITISH	flaky, when broken	roofs of caverns, Antiparos, and Derbyshire	Stalactites Albus.  an ornament for grottos.
2. GREY STALACTITE.							
Thick cones	hard	heavy	rumpled, and uneven	GREYISH	shattery	limestone caverns, Derbyshire	Stalactites Griseus, W.  for grotto work.
3. CHALKY STALACTITE.							
Coarse cones	soft	light	wav'd, and rumpled	PURE WHITE	dufty, when broken	vaults and arches, Windfor, &c.	Stalactites Cretaceus.  for grottos.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
4. RED STALACTITE.							
Short cones	brittle	very heavy	wav'd	RED	irregular, when broken	Derbyshire	Stalactites Ruber. W.
5. BLACK STALACTITE.							
Slender cones	very hard	heavy	rumpled	DEEP BLACK	flaky, when broken	Grapenberg, in Sweden	Stalactites Niger. W.
6. FOLIACEOUS STALACTITE.							
Thick cones	soft	heavy	uneven, and as it were leafy	YELLOWISH	thin flakes, broken	Hartzforest	Stalactites Feuillette. W.



S P A R.

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O R D E R IX.

S T A L A G M I T I C S P A R.

S T A L A G M I T E S.

Form'd into globular Figures, coated as an Onion.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE	USES.
I. SUGAR-PLUM STALAGMITE.							
Small, round lumps	soft	heavy	scaly	PURE WHITE	thin coated	Italy	curiosity.
2. GREY STALAGMITE.							
Round lumps	hard	heavy	bubbled	BROWNISH GREY	thick coated	Sweden	lime.
3. OVAL STALAGMITE.							
Small, oval lumps	tender	heavy	smooth	YELLOWISH	crackly	Zweybreck, in Sweden	lime.

Stalagmites  
Orobias.  
W.

Pisolithus.  
W.

Orobias  
Scheuk.



FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
4. FISH-SPAWN STALAGMITE.							
Great stony masses, of lit- tle oval lumps	soft	light	smooth	WHITISH	tender	Ketton, in Rutland	a building stone.  Meconites Scheuk.
5. SAND STALAGMITE.							
Stony masses of small grains	hard	heavy	rugged	REDDISH	shattery	Cornwall	a flux.  Ammites. B.
6. BLACK STALAGMITE.							
Small masses	very hard	heavy	scaly	DEEP BLACK	thin coated	Nerike, in Sweden	a flux.  Cenchrites Niger Scheuk.

S P A R.

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O R D E R X.

I N C R U S T I N G S P A R.

I N C R U S T A T I O.

Forming a stony coat upon mofs, or shells, or other substances.



FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. BROWN INCRUSTING SPAR.							
A thin coat	very soft	light	rugged	PALE BROWN	brittle	Yorkshire, in waters	curiosity.  Incrustatio Fusca.
2. GREY INCRUSTING SPAR.							
A thick coat	hard	heavy	wavy	GREYISH	firm	Sweden, on shells	curiosity.  Incrustatio Albida.
3. RUDDY INCRUSTING SPAR.							
Rude coats	tender	very heavy	uneven	REDDISH	brittle	forest of Dean	curiosity.  Incrustatio Rubescens.

**T**H ESE, fo far as I have yet seen, are all the Species of Spar: but so many there are; and thus they may be arranged in a cabinet. They are more than is usually thought: but the eye shews them; and their existence cannot be disputed.

If the term Species be question'd, and it be said, that many here called such, are only Varieties; I cannot agree to that term as a subdistinction, tho' many, and great names support it. I should be sorry, any of those Authors entered into a dispute about it; for I should be obliged to tell them, that there is no real distinction of Species in Spar. Spar is but one body, and all its appearances are Varieties: however, the numbering them as Species, fixes their names; and ascertains the account, without the confusion of a useless subdistinction.



## NATIVE FOSSILS.

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CLASS IV.

## CRYSTAL.

## CRYSTALLUS.

A pure Fossil, bright, glassy, not fissile, nor breaking into regular forms.

IT has been said that Crystals break into Columns, as Spar breaks into Rhombs; but 'tis not so: the trial is easy; and will contradict the assertion: Spar is formed of connected Rhombs; Crystal is as a mass of melted glass.

Like Spar, or Selenite, it is one thing; what are called Species, are varieties; and these varieties arise from accidents, and are not in the nature of the body.

The natural place of Crystal is in the clefts of rocks: but only of such rocks as have a crystalline matter for their base. No man ever saw Crystal in the fissure of a limestone rock, or Spar in a crystalline one.

It sometimes lines these cavities with a pure wall of seeming glass; sometimes even fills the fissure with one vast mass; and when rendered foul by great quantities of earth, it forms whole rocks, whole mountains.

Q

These

These splitting, water washes it pure again into the cracks; and thus is the eternal circle kept in being.

Pure Crystal that has connected slowly, is colourless, pellucid, and of an angulated form; a Prism, with a Pyramid at each end; this is its proper shape: but as it has been disturbed in its formation, or fouled with mixtures, it assumes variously angulated Figures; or forms masses not angular; and loses of its transparency, and gains new colours.

Under this variety of appearances, it is to be considered in the arrangement of a cabinet; and thus its forms are to be laid down here: those who please may call them Species; those who chuse may enter them as varieties, or dispute about the vanity of terms: here they are laid down only as so many numbered appearances of the one thing Crystal, and reckoned as no other. They will be best understood by distributing them into various Orders, according to their general marks of difference; and so much we allow: the rest is folly.



# NATURAL METHOD of SPARS.

## The ORIGINATION of their FORMS and COLOURS,

according to the Course they have run before Concretion.

Mineral Acid — Acidulated Water

Acidulated Water — Mineral Acid

Bitumen

Bitumen

Sulphur

Sulphur

Limestone

Limestone

### SPARR.

and this thro'

This Rhombites  
This Pellucida

By flower Concretion

Spatum Speculare Duplicans

This running

running thro'

3<sup>b</sup>. Saline deep-lodged Earths

4<sup>b</sup>. Natrane Pure

becomes Spatum Cristallifatum Cubicum. W.

Ferrum Tessulare	becomes	Drufa Pallefcens.
Plumbum Compactum		Drufa Violacea.
Bismuthum	— —	Drufa Nigra.
Molybdæna Plumbago		Drufa Grifeo-fufca
Argentum Album	—	Drufa Subcœrulea.
Ferrum Hepaticum	—	Drufa Rufa.
Aurum Marcaffiticum	—	Drufa Rubea.
Argentum Rubrum	—	Drufa Rubefcens.

4. Selenites

Gypfum Opacum	— —	Androdamas Alba.
Lapis Hepaticus	— —	Spatum Pellucidum Flavescens. W.
Selinites Flavus	— —	Spatum Pellucidum Croceum. W.
Hepaticus Niger	— —	Spatum Pellucidum Nigricans. W.
Gypfum Virens	— —	Androdamas Smaragdinus. Scheukz.
Selinites Verficolor	— —	Spatum Pellucidum Venosum. W.

5. Sand Stone

Creta Rara	— — —	Spatum Arenaceum Album. W.
Guhr Cinereum	— —	Spatum Arenaceum Cinereum. W.
Ferrum Commune	— —	Spatum Arenaceum Rubrum. W.

6. Sulphurs

Cryftalinus	— — —	Lapis Suillus Prismaticus. W.
Pyrites Figuratus	— —	Lapis Suillus Radiatus. W.
Nativus	— — —	Lapis Suillus Sphericus. W.

7. Talc

Talcum Aureum	— —	Spatum Undatum. L.
Ollaris	— — —	Spatum Aqueum Hartenfe. W.
Talcum Albicans	— —	Spatum Fiffile. L.

8. Cos Quadrum

— Spatum Lateribus Nitidis. W.	Quartzum Lacteam	Spatum Cryftalifum Globosum. W.
	Quartzum Fiffile	Spatum Cryftalifatum Cylindricum. W.
	Quartzum Opacum	Spatum Botryiticum. W.

9. Crystal Beds

Spatum Scintillans. L.	Marga Cretacea	— —	Spatum Dimidiatum. W.
	Leucargilla Cinerea. W.		Spatum Plexum Tetradecahædrum. W.
	Argilla Fufca	—	Spati Echinorum Imperati.
	Argilla Pallida	—	Spath Cryftalifée en Rosés. W.

{ With a flow Course, after long Rest, thro'

15. Earths	Humus Rubra. W.	—	Incrustatio Rubefcens.
	Creta Mollis	— —	Incrustatio Albida.
	Humus Atra	— —	Incrustatio Fufca.
16. Calcareous Stones	L. Calcareus Niger. W.	—	Cenchrites Niger. Scheuk.
	L. Calcareus Albus. W.	—	Ammites. B.
	L. Calcareus Grifeus. W.	—	Meconites. Scheuk.
	L. Calcareus Undulatus. W.	—	Orobias Scheuk.
	L. Calcareus Stratofus	—	Pifolithus. W.
L. Calcareus Fufcus	—	Stalagmites Orobias. W.	

{ With Coldness, and a flow Course, after long Rest, thro'

10. Alabafter	Alabafter Durum. W.	—	Stalactites Feuillette. W.
	Alabafter Maculis Nigris	—	Stalactites Niger. W.
	Alabafter Oychites	—	Stalactites Ruber. W.
11. Marble	Alabafter Candidum	—	Stalactites Cretaceus.
	Pierre à Chaux Blanc	—	Stiria Fufca.
	Marbre Rouge	—	Stiria Amethyftina.
	Marbre Jaune. W.	—	Stiria Flavescens.
	Marbre Blanc	—	Stiria Decolor.
12. Lime	— — — —	—	Stalactites Grifeus. W.
13. Chalk	— — — —	—	Stalactites Albus.
14. Or raised by Heat in Vapour	— — — —	—	Stiria Aeria.

1. Earths, fimple and superficial

Ores	of Copper	Chalky	—	becomes	Spatum Compactum. L.
		Yellow Ochreous	—	—	Spatum Speculare Flavescens. L.
		Red Ochreous	—	—	Spatum Rubrum Compactum. L.
		Armenus	—	—	Spatum Speculare Virefcens.
of Lead	Malachitis	—	—	Spatum Speculare Cœrulefcens. L.	
	Fahlertziana	—	—	Rhombites Opalina.	
	Galena	—	—	Spatum Compactum Flavescens. L.	
of Antimony	Virens	—	—	Spatum Compactum Virefcens. L.	
	Compactum	—	—	Rhombites Aurantiaca.	
of Tin	—	—	—	Alumen Quartzofum. L.	
				—	Le Spath Cubique. W.

and then thro'

3 <sup>a</sup> . Saline deep-lodged Earths	of Vitriolic	Calx Nativa	— — —	Fluor Bicuspidatus Diaphanus. W.
		Ferrum Spatofum	— — —	Fluor Bicuspidatus Martialis. L.
		Lithomarga	— — —	Dent des Cochons à Deux Pointes. W.
of Aluminous	—	—	—	Spatum Cryftalifatum Hexangulare. W.
	Calaminaris Ferruginea	—	—	Fluor Columnaris Tetragonus. W.
	Pyrites Ferri	—	—	Fluor Columnaris Trigonus.
	Auripigmentum	—	—	Spatum Prismaticum Hexangulare. W.
of Muriatic	Pyrites Cupri	—	—	Spatum Prismaticum Truncatum. W.
	Ferrum Arenosum	—	—	Spatum Cryftalifatum Tetradeca-hædrum. W.
	Plumbum Galæna	—	—	Fluor Pyramidalis Polygonus.
	Stibium Striatum	—	—	Spatum Pyramidale Endeca-hædrum. W.
	Plumbum Spatofum	—	—	Spatum Pyramidale Octa-hædrum. W.

the Brown Drufa Fufca  
the White Drufa Lactea

and this running thro'

4 <sup>a</sup> Natrane	the Pure Spatum Cryftalifatum Cubicum. W.	Ferrum Calcareum	—	Drufa Fulva.
		Cuprum Schistofum	—	Drufa Amethyftina.
		Cuprum Nikelum	—	Drufa Cœrulea.
		Cuprum Lazuli	—	Drufa Viridis.
		Cuprum Cotaceum	—	Drufa Violacea.
		Plumbum Spatofum	—	Drufa Cœruleo-virens.
		Plumbum Virens	—	Drufa Smaragdina.

the Grey Drufa Grifea







# C R Y S T A L S.

## O R D E R I.

Of angulated Figures.

## T R I B E I.

In form of a Prism of six sides, terminated by a Pyramid of six sides, at each end.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. PURE CRYSTAL*.							Cryſtal de Roche à deux Pointes. W.
Slender	very hard	heavy	bright, and poliſh'd	TRANSPA- RENT, AND COLOUR- LESS	pure	Bristol	glaſs.

\* This differs in nothing from the form of pure Spar, but that the points are perfect and ſharp here, never in the Spar.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
2. TOPAZ * CRYSTAL.							Nitrum Lapidofum Flavum. L.
Short	hard	very heavy	glossy	YELLOW	very pure	the Brazils, and Bohemia	a gem.
3. HYACINTHINE * CRYSTAL.							Nitrum Lapidofum Purpurofulvum. L.
Long, and slender	hard	heavy	polish'd	FLAME COLOUR'D	pure	Sweden	gem.
4. BERYLL CRYSTAL.							Nitrum Lapidofum Cyaneum. L.
Small	very hard	heavy	glossy	BLUE GREEN	watery	Germany	gem.

\* These are called by some the occidental Gems, occidental Topaz, and the rest: but they are nothing but coloured Crystal; the most perfect and finest of them keep the proper form of the Prism, with two Pyramids; but as they have concretion hastily, or been mixt with less pure matter in concretion, they lose of their Figure, keeping sometimes only one of the Pyramids, or in some scarce any angulated form; but still they are to be known by their brightness, and according to their colours.



Nitrum Lapidofum  
Caruleum.  
L.  
gem.  
Nitrum Lapidofum  
Viride.  
L.  
gem.  
Nitrum Lapidofum  
Rubrum.  
L.  
gem.  
Nitrum Lapidofum  
Violaceum.  
L.  
gem.

Bohemia  
Switzerland  
Peru  
Bohemia

bright  
cloudy in  
parts  
perfectly  
pure  
cloudy in  
part

FINE BLUE  
PURE GREEN  
FINE RED  
PURPLE

polished  
bright,  
and  
glossy  
lineated  
polished

5. SAPPHIRE CRYSTAL.  
Thick | hard | heavy  
6. EMERALD CRYSTAL.  
Long | tender | heavy  
7. RUBY CRYSTAL.  
Short and  
thick | very hard | heavy  
8. METHYSTINE CRYSTAL.  
Short and  
thick | tender | very  
heavy

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
9. BROWN CRYSTAL.							
Thick	very hard	heavy	breaky	DULL BROWN	clear	Norway	Nitrum Lapidofum Nigricans. L. for seals.
10. WHITE CRYSTAL.							
Large	tender	lighter	smooth	WHITISH	cloudy	Gloucester- shire	glafs.
11. BLACK CRYSTAL.							
Small	very hard	heavy	glossy	PERFECTLY BLACK	opaque	Bristol	grottos, glafs Cryfallus Nigricans. Bom.



# C R Y S T A L S.

## ORDER I.

### TRIBE II.

In form of a Prism of six sides, with a Pyramid at one end; and fixed to the Rock at the other.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. PURE SPRIG CRYSTAL.* Large	hard	heavy	glossy	COLOUR- LESS	perfectly pellucid	every where in rocks	Nitrum Lapidofum Oblongum. L. grottos.

\* This is found coloured in all the dyes of the preceding. Those Specimens should be arranged under the pure, as in that Species; but they can have no new name; they are to be called Topaz Crystal, as the former. There must be but one name for them, and those; for they are but one thing in nature and in construction, tho' the forms differ.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
2. BROAD SPRIG CRYSTAL. Large	hard	very heavy	polished	WATERY	cloudy	Bristol	* Nitrum Quartzosum Lateribus duobus latioribus. L. glafs.
3. NARROW SPRIG CRYSTAL. Small, and long	hard	very heavy	glossy	WHITISH	foul	Forest of Dean	glafs.
4. LONG SPRIG CRYSTAL. A small, long column	very hard	heavy	bright	COLOUR- LESS	perfectly pellucid	Switzerland	Cryſtalus Planis Intermediis Majoribus Steno. glafs.
5. SHORT SPRIG CRYSTAL. A thick, short column	hard	heavy	rugged	WHITISH	cloudy	Germany	Nitrum Lapidosum Subacaule. L. glafs.

\* Linnæus has been free in the use of the name, Nitre, for these Cryſtals; for by his plan they are kinds of Nitre. I love and honour him, but can't adopt this Salt System. I hate to contradict a Genius of ſo vaſt merit; but we muſt by that freedom, come at real knowledge. It is not Nitre Cryſtal moſt emulates in its form: 'tis the vitriolated Tartar that Cryſtal reſembles; an artificial, not a natural Salt.



# C R Y S T A L S.

## T R I B E III.

In form of Pyramids, without a Column.

FORM.	HARDNESS	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
I. CLEAR DOUBLE CRYSTAL. Two short pyramids, base to base	hard	heavy	glossy	COLOUR- LESS	pellucid	Sweden	Nitrum Lapidofum Acaule. L. glaſs.
2. BROWN DOUBLE CRYSTAL. Two thick pyramids	hard	heavy	lineated	PALE BROWN	pellucid	Grenades	glaſs.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
3. LOW CRYSTAL. *							
A pyramid fixt to rock	very hard	heavy	bright, and glossy	COLOUR- LESS	pellucid	Bristol	grottos.

\* Of this form also there are occidental Gems; they should be ranged under this, in a cabinet, as varieties of this variety, but they can have no other names than the first, because they are no other thing.

All these kinds of Crystal are best understood when we find them single, but they are most frequent in clusters; the single ought to be placed first in each kind, and the clustered to follow.

# C R Y S T A L S.

## TRIBE IV.



FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. COATED CRYSTAL.							
A covered column	hard	heavy	very rugged	RED OR GREEN	colourless when the coat is off	Cornwall	Nitrum Lapidofum Opacum. L. grottos.
2. WATER CRYSTAL.							
A column with a drop in it	hard	light	glossy	COLOUR-LESS	streaky	Germany	curiosity.
3. HOLLOW CRYSTAL.							
A column empty and hollow	hard	heavy	polished	WHITISH	watery	Switzerland	Nitrum Lapidofum Inane. L. curiosity.
4. TALCY CRYSTAL.							
A column	hard	heavy	glossy	COLOUR-LESS	with spangles of Talc within	Germany	curiosity.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
5. ASBESTINE CRYSTAL. A thick column	hard	heavy	lined	PELLUCID	fibres of Asbestos within	Sweden	curiosity.
6. MARCASITE CRYSTAL. A column	hard	heavy	streaky	CLEAR	spangles of marcasite within	Germany	curiosity.
7. ANTIMONIATE CRYSTAL.* A coarse column	hard	heavy	rugged	WHITISH	with antimony ore in it	Sweden	curiosity.

\* There may be more of these, and they should have their places after them. These are all I have seen: and 'twill be well if those who fancy others, will attend to Cronstedt's caution, and see they do not take Asbestos for grafs, and earth for mofs.



# C R Y S T A L S.

## I. O R D E R I. T R I B E V. S A R E N D S. A R E N Æ.

Broken; irregularly angulated, and in form of powder.

### I. P U R E S A N D S.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. PURE CRYSTALLINE SAND.							
Large dust	hard	heavy	glossy	COLOUR- LESS	angulated	Perfia	Arena Mobilis & L.
2. ROUND CRYSTALLINE SAND.							
Round granules	hard	heavy	rough	COLOUR- LESS	rounded	the Me- diterranean shores	Arena Mobilis & L.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
3. VOLATILE SAND.							
Fine dust	soft	light	dufty	WHITISH	angulated	Arabia	Arena Mobilis γ. L.
4. ORANGE SAND.							
Large grains	hard	heavy	rugged	ORANGE-COLOUR'D	coarse	Surinam	Arena Colorata α. Lin.
5. WHITISH SAND.							
Rough particles	hard	heavy	rugged	WHITE	opaque	Hertfordshire	Arena Colorata β. L.
6. PALE YELLOW SAND.							
Irregular grains	hard	heavy	rugged	PALE YELLOW	foul	every where	Arena Colorata γ. L.



Arena  
Colorata ♂.  
L.

Arena  
Colorata ♀.  
L.

Arena  
Lacustris.  
L.

Arena  
Campestris.  
L.

7. RED SAND.

Large grains  
hard  
heavy

Shores of Red  
Sea

DULL RED  
clear

8. VIOLET SAND.

Large grains  
hard  
heavy

Shores of the  
Baltic

PURPLE  
bright

R 4

9. PALE SAND.

Great gra-  
nules  
hard  
heavy

Shores of  
rivers

PALE  
YELLOWISH  
BROWN  
rounded  
grains

10. HILL SAND.

Irregular  
grains  
hard  
heavy

high grounds  
and woods

BROWNISH  
GREY  
some  
rounded  
grains

smooth

polished

smooth

uneven

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
II. COATED SAND.							
Large grains	soft	heavy	coated with earthy shells	WHITE	rounded grains	Sweden	Arena Margariae L.
12. HEATH SAND.							
Very small grains	soft	light	dufty	REDDISH GREY	rudely angulated	Heathsevery where	Arena Glarea L.
13. OCHREOUS SAND.							
Small grains	soft	light	rough	YELLOW	angulated	near ferruginous springs	Arena Ochracea L.
14. FLINTY SAND.							
Great particles	harsh	heavy	polished	HORN COLOUR'D	angulated	England	Arena Silicea L.



## 2. MIX'D SANDS.

### 15. RUSTIC SAND.

Rude particles      harsh      light

### 16. RUGGED SAND.

Unequal particles      harsh      light

### 17. CASSERITE SAND.

Fine particles      soft      light

### 18. YELLOW GLIMMER SAND.

Small particles      soft      light

BROWN, AND GREY	rugged	mix'd of broken stone, and sand	Suffex, Sweden
BROWN, AND WHITE	rough	of stone, sand, and talc	Sweden
MILKY WHITE	smooth	spangles of glimmer	Casserite Island
GOLD YELLOW	glossy	of yellow mica, and sand	Sweden

Arena  
Rufica.  
L.

Arena  
Sabulum.  
L.

Arena  
Casserita.  
L.

Arena Micacea  
Aurea.  
L.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
19. WHITE GLIMMER SAND. Small particles	soft	light	glossy	SILVERY WHITE	of white mica, and sand	Sweden, Germany	Arena Micacca Argentea, L.
20. GOLD SAND. Uneven particles	harsh	heavy	shining	YELLOWISH	grains of pure gold	Africa, and East Indies	Arena Aurea, L.  for gold.
21. IRON SAND. Sharp particles	hard	heavy	glittering	BLACK	angulated and flatted particles	Italy, Sweden	Arena Ferreca, L.  for writing.
22. GRANITE SAND. Rude particles	harsh	heavy	shining	MIXT OF WHITE, RED, GREEN, &c.	of fragments of granites	Minorca, &c.	'Saburra [ Granatica, H.



23. PORPHYRY SAND †.

Unequal parts

hard

heavy

smooth

MIXT OF  
PURPLE,  
WHITE, &c.

composed  
of frag-  
ments of  
porphyry

Ægypt

Sabarra  
Porphyrina.  
H.

3. SHELLY SAND S.

Unlike particles

soft

light

dull

BROWN,  
AND  
WHITE

mix'd of  
crystal,  
talc, and  
broken  
shells

Ægypt

Arena  
Ægyptiaca.  
N.

24. ÆGYPTIAN HOUR-GLASS SAND ‡.

† These are formed of fragments of Granite, Porphyry, and other Stones, beaten to powder, one against another. They are not genuine Sands, and there may be as many kinds enumerated as there are Stones; but these in their genuine state, will have their place hereafter.

‡ This, and the three following, are now first known to me; the gift of my great patron. They are objects for the microscope, and of the very finest kind; they are full of minute, but perfect shells; many of them Species, not otherwise known.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
25. CHIOZAN SAND.							Arena Chiozana,
Most unlike particles	harsh	light	shining	BLACK, WHITE, AND REDDISH	of crystal, iron, sand, jet, marca- site, and en- tire small shells	Italy	
26. RIMINIAN SAND.							Arena Riminiana, N.
Very large, unlike par- ticles	harsh	light	glittering	BLACK, AND WHITE	of crystal, iron, sand, jet, corals, and entire shells	Rimini	
27. BONONIAN SAND.							Arena Ammonifera. N <sub>o</sub>
Foul par- ticles	soft	light	dull	YELLOWISH	of crystal, talc, clay, and small ammonitæ	Italy	



# C R Y S T A L S.

## ORDER II.

In masses not angulated.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. PEBBLE CRYSTAL.							Quartzum Purum Cronstedt.
A round lump	hard	heavy	wavy	COLOUR- LESS	pellucid	Brafsils, &c.	spectacles.
2. WHITE PEBBLE CRYSTAL.							Quartzum Pingue Cronstedt.
Round stones	hard	heavy	uneven	WHITISH	watery	Sweden	glafs.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
3. BLUE PEBBLE CRYSTAL.							Quartzum Caruleum Cronstedt.
Small lumps	very hard	heavy	smooth	PALE BLUE	clear	Island of Uto	a false gem.
4. AMETHYSTINE PEBBLE CRYSTAL.							Quartzum Amethystinum Cronstedt.
Large lumps	hard	heavy	glossy	VIOLET PURPLE	clear	Island of Uto	a false gem.
5. SANDY PEBBLE CRYSTAL.							Quartzum Granulatum Cronstedt.
Great lumps	very hard	very heavy	granulated	MILKY	cloudy	Sweden	glass.
6. GREENISH PEBBLE CRYSTAL.							Quartzum Granulatum Virefcens Cronstedt.
Small lumps	hard	heavy	rugged	PALE GREEN	clear	Sweden	glass.



7. SHATTERY PEBBLE CRYSTAL.	hard	very heavy	rugged	WHITE	breaks in- to broad Plates	Sweden	glafs.
8. YELLOW SHATTERY CRYSTAL.	very hard	heavy	uneven	PALE YELLOWISH BROWN	flaky	Gold mines of Hungary	Quartzum Spatofum Flavum Cronstedt.
9. BLOCK CRYSTAL.	very hard	heavy	uneven	WHITISH	clear	Germany, in cracks of rocks	glafs.
10. CURTAIN CRYSTAL.	hard	heavy	undulated	CLEAR AND CO- LOURLESS	watery	Persia	glafs.

\* The names of authors run out to an immoderate length; those I give from them mark the difference of kind, and are a sort of rendering them from Specific, into Trivial; this may serve as an instance: the words Quartzum Spatofum are not in Cronstedt, but whoever turns to his chapter of Quartzum, and finds the name Quartzum Textura Spatosa, will know 'tis that quoted here, and spare the Textura, I hope, with pleasure.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
II. BLACK PEBBLE CRYSTAL.							
Vast lumps	very hard	very heavy	botryoid	BLACK	crackly	Sweden	Quartzum Ferreum Cronstedt. an iron ore.
12. RUDDY PEBBLE CRYSTAL.							
Great masses	hard	very heavy	irregular	DULL RED	crackly	Smoland	Quartzum Cupro Mixtum Cronstedt. a copper ore.
13. JACOBINE PEBBLE CRYSTAL.							
Round lumps	very hard	heavy	wav'd	VEIN'D BLACK AND WHITE	dull	Sweden	Quartzum Aqueolactum. W. Lutum Strab.
14. WORM-EATEN PEBBLE CRYSTAL.							
In sieve-like masses	hard	heavy	rugged	BROWNISH	eaten in holes as it were	Germany	
15. RIDG'D PEBBLE CRYSTAL.							
In rounded masses	hard	very heavy	ridg'd	BROWNISH RED	raised in edges	Germany	Quartzum Granatum. W.



## NATIVE FOSSILS.

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CLASS V.

## GEMS.

Hard, bright, sparkling; in small angulated masses; composed of fine Plates.

THE Gems are naturally angular, as are the Crystals: but like them, from various accidents in their formation, they are found sometimes in rude or shapeless masses; and when angular, they have still all that variation of Figure which we see take place in Crystal and Spar; from the different disturbances of their crystallization. In all these cases the various number of angles may be occasioned, as we see in Salts, from the accidents of their concretion. In these, as well as in those, we have the same kind in different Figures; and as we can crystalize them under the eye, we can determine the causes of those alterations. The round, or pebble Gems, seem not to have been original in that form, but worn to it by rolling about in a fluid.

The hardness and the lustre of the Gems, must distinguish them from all other Stones; for if we considered their form, as their essential character, many Crystals would assume the name: and Cronstedt

has well determined, that a certain Spar he had seen in Figure of the most regular Diamond, must then be call'd, a Diamond.

No peculiar construction, no form of constituent parts is visible in the Gems: they appear as masses of uniform nature; and they break irregularly and indeterminate; yet there is in all a really plated structure. The Lapidaries find this in some, and can split them; the burning glass discovers it in the rest; and when turned to it in a right direction, tears them to pieces: they split into the thinnest Plates that can be conceived, and seem to have been composed in the manner of the Talcs, only more compact. 'Tis pity this character is not more obvious: for it affords a real distinctive mark between the Gems, and all other Stones; Crystals, which seem to come nearest to them, have it not.

Their colours are less essential, for they can in most be driven away by fire; and nature sometimes gives the Gem without them; they are evidently owing to the metals; for we can by means of metals, give the same to glass; our artificial Gem.

The Salt System of Linnæus appears here almost ludicrous. To a truly philosophic eye, the difference of estimation and price are nothing; but the common Reader will hardly keep his countenance when he sees the Diamond reduced to a Species of Alum; and the Emerald of Borax.



# D I A M O N D S.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. ORIENTAL DIAMOND.							
S Octahædral	hardest	heaviest	brightest	LIVELIEST	most sparkling of all gems	East Indies	Adamas Gemma. W.
2. BASALTINE DIAMOND. BRAZIL DIAMOND.							
Dodecahæ- dral	very hard	heavy	bright	LIVELY	sparkling	Brafils	Le Diamant de Brafil de Lifse.

The form of the Brazil Diamond differs from the Oriental, as well as do its qualities: there are Shirly, or Basaltine, resemblances of all the Oriental Gems; and this is such of the Diamond; and no other. De Laet was acquainted with it, and with its qualities. Agricola knew its Dodecahædral form. Wallerius accurately describes its faces by their cubic shape. The Brazil Diamond has the same electric, and the same philosophic properties, with the Oriental: After it has been held

held in the sun, it has a silvery brightness in the dark; and the same quality, in some degree, when rubb'd: and it takes the foil, as the Oriental Diamond. But they all want the perfect hardness of the Oriental Diamond; and they have somewhat less specific gravity; and they can be melted by the extrem force of fire, which the Oriental Diamond cannot; it can only be torn into flat Flakes, and that way shews it has a structure such as the Zeolite, tho' like that it be obscure.

We are not to expect all Diamonds in their perfect crytallized form; we see them rounded in the manner of the pebble Crystals, and like all other crytallized Stones, they vary in the number of the angles, even in the same Species.

Like all the other crytalline stones, this is also liable to be tinged to all colours; but these tinges it receives in so small a quantity, and in a degree so delicate, that it is a doubt whether a coloured Diamond be not more beautiful even than a perfect clear one.

We talk of our vast Diamonds, the Tuscan, the Sancy, and Pitt's; but what are these to that of the Mogul, which before cutting weighed very near eight hundred carats?

### I. E M E R A L D S.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. ORIENTAL EMERALD.							
A column with a Pyramid * mid *	very hard	heavy	bright, and polished	PURE GREEN	keeps its colour in the fire	Ægypt	ornament.
							Smaragdus Orientalis. W.



2. OCCIDENTAL EMERALD.

A Prism  
without a  
Pyramid

tender

heavy

glossy

PALE  
GREEN

loses its  
colour in  
the fire.  
luminous  
in the dark  
after  
burning

Peru

ornament.

Smaragdus  
Occidentalis.  
W.

3. BRASILEMERALD.

A Prism  
with two  
Pyramids

soft

heavy

bright,  
and  
glossy

DULL  
GREEN

loses its  
colour in  
the fire

the Brazils,  
the Grenades

ornament.

Smaragdus  
Brasilienfis  
De Lact.

2.

I. ORIENTAL SAPPHIRE.

A Rhomb  
of unequal  
fides

very hard

heavy

glossy

FINE BLUE

keeps its  
colour in  
the fire

Pegou,  
Conanor,  
Ceylon

ornament.

Sapphirus Mas.  
W.

\* This is the perfect form; but we have said, how often it is altered, or defective, or rubb'd away, 'tis so in all; but the true form should always be known.

† The Sapphire has been supposed the same Stone with the Diamond, but 'tis not so: we have blue Diamonds, which are not Sapphires; and colourless Sapphires, which yet are not Diamonds; but they are very near it: one passed thro' many Jewellers hands as such some years ago.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
2. OCCIDENTAL SAPPHIRE.							
A furrow'd Prism with an obtuse Pyramid	tender	heavy	bright, but uneven	PALE BLUE	keeps its colour	Peru	Sapphirus Femina, W.  ornament.
3. GRASS SAPPHIRE.							
An octangu- lar Prism with a Pyra- mid	soft	heavy	wavy	BLUE, WITH A TINGE OF GRASS GREEN	loses its colour in the fire	Bohemia	Sapphirus Subviridis, W.  ornament.
R U B I E S.							
1. ORIENTAL RUBY.							
Octohædral of trigonal Planes	extreamly hard	heavy	bright, and polished	PURE, PER- FECT RED	keeps its colour in the fire	Pegou	Rubinus Orientalis, W.  ornament.



2. BRASILL RUBY.

A Prism of unequal sides, with a triangular Pyramid

hard

heavy

streaky

PALE RED

keeps its colour in fire

the Brazils

ornament.

Rubinus Incarnatus. W.

3. SPINELL RUBY.

A Prism with an irregular Pyramid

tender

heavy

scaly, but bright

ROSE-COLOUR

loses its colour in the fire

Peru

ornament.

Rubinus Subalbus. W.

4. TAWNY RUBY.

A short Prism with a long Pyramid

tender

heavy

uneven, and streaky

BROWNISH RED

loses its colour in the fire

Silesia

ornament.

Rubinus Rubacellus. W.

4. T O P A Z E S.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. O R I E N T A L T O P A Z.							
Two quadrangular Pyramids, base to base	extremely hard	heavy	bright, glossy	JONQUILLE YELLOW	keeps its colour in the fire	East Indies	ornament.  Topazius, W.
2. B R A S I L T O P A Z.							
A Prism of four sides, with two Pyramids	hard	heavy	polish'd	GOLD YELLOW	loses its colour in the fire	Brazils	ornament.  Topazius Aureus Cronstedt.
3. O R A N G E T O P A Z.							
A Prism with one Pyramid	tender	heavy	glossy	RUDDY YELLOW	loses its colour in the fire	Germany	ornament.



FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
4. SAXON TOPAZ. An octahæ- dral Prism, with two Pyramids	hard	heavy	rugged	PALE BROWN, PALE YEL- LOW, OR CO- LOURLESS	bright	Schneken- stein, in Saxony	Topazius Saxonicus Cronstedt.  ornament.
5. C H R Y S O L I T E S.							
1. ORIENTAL CHRYSOLITE. A Prism of six sides, with two Pyramids of four sides	very hard	heavy	polished	YELLOWISH GREEN	keeps its colour in the fire	Cananor	Chrysolithus Praefoides. W.  ornament.
2. OCCIDENTAL CHRYSOLITE. A Prism of five sides, with no Pyramid	tender	heavy	bright	PALE GREEN, WITH A YELLOW TINGE	loses its colour in the fire	Brazils	Chrysolithus Cryopratus. W.  ornament.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
<b>3. GOLD CHRYSOLITE.</b>							
A Prism with one Pyramid	hard	heavy	streaky	GOOD GREEN, WITH A CAST OF GOLD YELLOW	keeps its yellow in the fire	Peru	ornament.  Chrysolithus Prasus. W.
<b>5. H Y A C I N T H S.</b>							
<b>I. ORIENTAL HYACINTH.</b>							
A long Prism of four sides, with two Pyramids	very hard	heavy	striated	FLAME-COLOUR	keeps its colour in the fire	East Indies	ornament.  Lyncurius Veterum. H.
<b>2. BOHEMIAN HYACINTH.</b>							
A short Prism of four sides, with one Pyramid	hard	heavy	smooth, and glossy	YELLOWISH RED, WITH A TINGE OF GREEN	keeps its colour in the fire	Bohemia, Poland	ornament.  Hyacinth Chrysoptera de Lise.



Jargon  
d'Hyacinthe  
De Lisle.

ornament.

Grenate  
Rouge  
De Lisle.

ornament.

Grenate  
de Surian  
De Lisle.

ornament.

<p>3. J A R G O N H Y A C I N T H. *</p> <p>A long Prism, with one Pyramid</p>	<p>heavy</p>	<p>polished</p>	<p>P A L E Y E L L O W I S H R E D</p>	<p>keeps its colour in the fire</p>	<p>France</p>
<p>6. G A R N E T S.</p>					
<p>1. O R I E N T A L G A R N E T.</p> <p>A short hexædral Prism with two Pyra- mids</p>	<p>very heavy</p>	<p>ridged</p>	<p>B L O O D R E D, F I R E - C O - L O U R ' D T O T H E L I G H T</p>	<p>keeps its colour in the fire</p>	<p>Pegou</p>
<p>2. S O R A N E G A R N E T.</p> <p>A short Prism, with one Pyramid</p>	<p>very heavy</p>	<p>glossy</p>	<p>D E E P O R A N G E S C A R L E T</p>	<p>keeps its colour in the fire</p>	<p>East Indies</p>

\* This Stone is sometimes colourless, and has been call'd, a Soft Diamond; a term that needs no comment.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
3. JACYNTH GARNET.							
A long Prism, with two Pyramids	very hard	heavy	bright	CRIMSON, WITH A YELLOW TINGE	keeps its colour in the fire	Coromandel	Giacinto Guarnaccio De Lisle. ornament.
4. VIOLET GARNET.							
A short Prism, with one Pyramid	hard	heavy	polish'd	DEEP RED, WITH A PURPLE TINGE	keeps colour in the fire	Pegou	Rubino della Rocca De Lisle. ornament.
5. DEEP GARNET.							
Rounded and Polygonal	tender	very heavy	glossy	BLOOD RED	keeps its colour in the fire	Bohemia, in rocks	Grenat de Boheme De Lisle. ornament.
6. SPANISH GARNET.							
Globular, with many rhomboidal faces	tender	heavy	streaky	LIGHT RED	loses its colour in the fire	Spain, in slate	Grenat d'Espagne De Lisle. ornament.



8. BLACK GARNET.	very hard	very heavy	perfectly polished	ABSOLUTE BLACK	whitens in fire	Lapland	a poor iron ore.
8. GREEN GARNET.	hard	very heavy	glossy	PALE GREEN	whitens in fire	Saxony	ornament.
9. TOURMALINE GARNET.	hard	heavy	smooth	PURPLE	electrical when heated	Ceylon	Lapis Electricus Aët, Ber. curiosity.

\* Nothing is more irregular than the crystalized form of the Garnets. Wallerius has assumed these variations as characters, that could be considered as permanent; and De Lise counts in the same manner upon the inequality of their faces. I have examined a multitude, and find the same Stone varies in the number, and proportional breadth of the faces. What seemed most permanent in each, I have described, but owning still the uncertainty: he who would name Garnets from these differences, might make a thousand, but often a hundred of those would be the various crystalizations of the same Stone. What the Antients knew of them, and by what names they called them, may be seen in an edition of Theophrastus, which I published some time since; or more concisely in Mr. De Lise, who has done me the honour to perpetuate that, and my name in his immortal work.

## C L A S S VI.

## S H I R L I.

## B A S A L T E S.

An impure crystalized Fossil, hard and heavy; in form of polygonal Prisms, with trigonal heads.

**T**IS necessary this should follow the Garnets; for 'tis ally'd to them most nearly in form, and qualities; the number of faces in the Prism is various, and the Head is often wanting, but the Body is always to be known: and tho' but lately understood, is worthy great attention.

Its constituent parts are variously put together, but in themselves they are always the same: thus we see fibrous, flaky, and glassy shirls: the structure of the Talcs, the Crystals, and the Spars, are seen in their fragments; but still the constituent substance is the same. No wonder those who looked but little farther than the surface, were perplexed with this; but to a deeper search all becomes plain.

Linnæus refer'd the Shirls to Alum, for their form; De Boet considered them as Crystals: the late excellent



cellent Cronstedt seems to have understood them well : he first discovered their close resemblance to the Garnets ; and (discovering also the perfect uncertainty and vague determination of the sides and faces in the Garnets) connected both together for their matter ; and neglected (with great reason in his work) their form.

When pure, the Shirls strike fire with steel ; but some are so debased with earthy mixtures, that they do it poorly. None of them ferment at all with acids ; they all become electrical when heated : their number of faces varies in the same mass, one Prism being made to suit two others : as to size, we see them from that of Barley-Corn up to the Giant's causeway.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. STOLPENSHIRL.							
A simple Polygonal column, with a trihædral head	very hard	very heavy	smooth	RAVEN GREY	ten foot long	Misnia	curiosity.
2. IRISHSHIRL. GIANT'S CAUSEWAY.							
Jointed columns	hard	heavy	smooth	PERFECTLY BLACK	immense, of various faces, but alike in all the joints of each column.	Antrim	curiosity.
3. SPANISHSHIRL. CROSSSTONE.							
A black and white cross	hard	heavy	glossy	BLACK, AND PURE WHITE	small, with the figure of a cross	Andalufia	amulet.

Bafaltes  
de Stolpen.  
W.

Bafaltes  
Hibernicus  
Pl. Tran.

Lapis  
Crucis.  
W.



FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
4. FLINTY SHIRL. An oblong black Prism, with two Pyramids	very hard	heavy	polished	BLACK	glassy, when broke	Germany	Borax Lapideus Triquetrus. L.
5. RUDDY SHIRL. An oblong, ruddy Prism, with one Pyramid	hard	very heavy	smooth	RUDDY BROWN	granulated	Nerike, in Sweden	Basaltes Rufus Cronstedt.
6. GREEN SHIRL. A short, green Prism, with one Pyramid	tender	heavy	glossy	PALE GREEN	cloudy within	Sweden	Basaltes Virens Cronstedt.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
7. MULTANGULAR SHIRL. A Prism of many sides, with two Pyramids	hard	heavy	polished	DEEP GREEN	foul within	Germany	Schorl Verde Davila.
8. WHITISH SHIRL. White, long, angulated needles	tender	light	glossy	WHITISH, WITH A TINGE OF BROWN, OR BLACK	clustery	Bristol	Schorl d'Aiguille Davite.
9. VESUVIAN SHIRL. A hexædral flattened Prism, with two Pyramids	hard	heavy	even	YELLOWISH, OR BLACKISH	clustery	Mount Vesuvius	Basalte de Vesuvius De Lisle.



10. EMERALD SHIRL.  
MOTHER OF EMERALDS\*.

A Polygonal Prism, with one Pyramid

tender

heavy

11. STRIATED SHIRL.

A truncated Prism of many sides

hard

very heavy

12. STARRY SHIRL.

Thick masses of many angles

tender

very heavy

cloudy within

FINE GREEN

polished

ornaments.

Ægypt

WHITISH, WITH

STAINS OF

of a striated texture

RUDDY BROWN, OR BLACK, OR GREEN

glossy

Sweden

brownish, clouded with black and green

uneven

Sweden

radiated, as a star

Balsates Spatofus Cronstedt.

Balsates Fibrosus Cronstedt.

Balsates Concentratus Cronstedt. Asbest Fauße. W.

\* Mr. Dacosta errs, in supposing this not to be the Mother of Emerald: Cronstedt is a great authority; but the truth is confirmed by a much greater, that of our senses. I wish this ingenious and knowing mineralist had spared the unkind note on his great author.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
13. DEBAS'D SHIRL.  Vast rude masses	hard	very heavy	irregular	BROWN, WITH GREY, RUDDY, OR BLACK SPOTS	stony	Sweden	Balsites Saxcus Cronstedt.

C R Y S T A L S.

O R D E R VIII.

Z E O L I T E S.

Pure Fossils in columnar forms, hard, heavy, bright, and flaky.

These resemble the Shirl in all things; but that, when viewed with good glasses, their texture is flaky. They are harder than Spars, but less hard than pure Crystal; they do not effervesce with acids, but they are soluble in that of Nitre; and the solution becomes a hard jelly.

They melt freely in the fire, and yield a light like the flame of electricity just in the moment of their fusion.



FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. JONQUILLE ZEOLITE.							
Convergent Pyramids	hard	heavy	perfectly polished	JONQUILLE YELLOW	cluster'd, in small flakes	Sweden	Zeolithus Crystallizatus Cronstedt.
2. PURE ZEOLITE.							
A truncated Prism	hard	heavy	glossy	COLOUR-LESS	single, with fine flakes	Sweden	Zeolithus Distinctus Cronstedt.
3. HYACINTHE ZEOLITE.							
Small masses	tender	very heavy	glossy	FLAME-COLOUR'D	shattery	Sweden	Zeolithus Spatoius Cronstedt.
4. BLUE ZEOLITE.							
Rude masses	hard	very heavy	uneven	BLUE, WITH YELLOW AND WHITE SPOTS	breaks like flint	Persia	Zeolithus Carulens Cronstedt.
5. WHITE ZEOLITE.							
Large masses	very hard	heavy	rugged	YELLOWISH WHITE	flinty	Denmark	Zeolithus Durus Albus Cronstedt.

## NATIVE FOSSILS.

## CLASS VII.

## ASBESTINE FOSSILS.

## ASBESTIÆ.

Pure Fossils, composed of strait, parallel threads, flexible, but not elastic.

**T**HE Asbestos bear the fire; and webs wrought of them may be cleaned by burning: but this is never done without a degree of injury; for on the most careful trials, I have always found Native Asbeste of the same kind more flexible than what has been burnt: there is a leathery toughness in most of the pure sorts, when kept as they were taken out of the earth; but it is lost by burning.

'Tis said, the Asbesti are formed of Talc, resolving itself into Clay: it must then have been striated in the plated state: but 'tis not so. Few people have glasses of more power than mine, and I have examined the purest Talc, but never seen this. If these authors would infer it from some debased talcy substances, which are striated, they want that precision, without which little is to be determined in this study. Besides, this change would infer, that the alteration of form

ren-



renders the same body different in the fire; the last and greatest of all tests of Fossils.

Talc is unalterable in the fire; Asbeste is hardened in it; and Clay runs to Glass: therefore, according to this plan, one body, Talc, can afford three different conditions in the fire; as it happens without mixture, for that is not supposed, only that it has changed its form. I reverence Linnæus, yet do not receive his assertion, *Mica concretio Argillæ*, as absolute and certain: nor will himself, when he has but given it this consideration: nor yet the general character, *Amianthus lapis ex Argilla*; till we have found *Mica Amianthus* and *Argilla*, suffer the fire alike. Nor will the opinion of Cronstedt overrule the doubt, for 'tis but an opinion; and I should have expected, and have wished, to have found it rather in any other author.

The Asbestos are the softest, and the lightest of all minerals; they have no determinate manner of breaking; they always lie in the beds with horizontal fibres; never perpendicular, and seldom much inclin'd; they are so tough you twist them like hemp; so light they swim on water: too soft for striking fire; and too fixed for all the power of acids. Some resemble animal, as others vegetable substances; and hemp and leather equally are imitated by them: some masses look like Fossil wood; and some like efflorescences of Salts, but they soon disclose their nature, on handling; separating easily into threads, and having nothing of a saline quality.

# ASBESTINE FOSFILLS.

## ORDER I.

### ASBESTE.

#### ASBESTUS.

Composed of strait, even, parallel, long threads.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. PURE ASBESTE*. Long, entire threads	tender	very light	glossy	GREY	most flexible	Siberia, Cyprus	Amiantus Abefus L. wicks of lamps

\* This is spun into purfes, and made into paper; but there is more in the name than the use.



FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
2. GLASSY ASBESTE.							
Bright, short threads	hard	heavy	polished	OLIVE-COLOUR'D	brittle	Sweden, Anglesea	Amiantus Fragilis. L. curiosity.
3. WOODY ASBESTE.							
Masses like fossil wood	hard	heavy	streaky	PALE BROWN	scarce separable into threads	Italy	Amiantus Immaturus. L. curiosity.
4. EARLY ASBESTE.							
Flat, coarse plates	tender	heavy	clay-like, but striated	PALE GREY	breaks in parting	Germany	Amiantus Terrestris. L. curiosity.
5. RADIATED ASBESTE.							
In starry clusters	hard	heavy	glossy	OLIVE-COLOUR'D	moses-like	Sweden	Amiantus Radians. L.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
6. GREEN ASBESTE.							
Flat masses	tender	heavy	uneven	DIRTY GREEN	not to be separated into threads	Germany	Asbeste non Mur Verdâtre. W.
7. BLACK ASBESTE.							
Small masses	hard	heavy	glossy	DEEP BLACK	scarce separable	Crete	Asbeste non Mur Noirâtre. W.
8. CRYSTALLINE ASBESTE.							
Thin plates	hard	heavy	polish'd	COLOUR-LESS	not separable	Germany	Asbeste non Mur Transparente. W.
9. BRUSH ASBESTE.							
Small tufts	tender	heavy	rugged	GREYISH	firm	Sweden	Asbeste en Bouquets. W.



# ASBESTINE FOSSILS.

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## ORDER II.

### AMIANTH.

#### AMIANTUS.

Composed of slender, cluster'd fibres, intricately mixed.

**T**HESSE partake so much of the Asbestine nature, that they always lie lengthwise, not perpendicularly in their beds: and they split lengthwise only, tho' it be less regularly than the Asbestos. The Amianths will not spin into cloths, but paper may be made of some of them, and 'tis curious to see the writing burnt out, and the paper clean for fresh use: but the use is little.

Reiger has taken great pains to prove it a vegetable substance, not mineral; but his numerous reasons might have been all obviated, if he had thought of putting a bit of it into the fire.

It is singular, that a substance very much resembling the Amianths, may be made by art, with Arsenic, and the Vitriolic Acid.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. PLUME AMIANTH. PLUME ALUM.							
Oblong masses	soft	very light	woolly	PALE GREY	swims in water	Denmark	irritation in palsies
2. CHAFF AMIANTH.							
Rough lumps	brittle	light	prickly	RUDDY GREY	finks in water	Sweden	Lapis Acerofus Rafilis. W.
3. HARD AMIANTH.							
Small clusters	hard	heavy	covered with points	GREY	finks in water	Germany	Lapis Acerofus Rigidus. W.



4. PERPLEX'D AMIANTH.

Small masses | tender | heavy

5. RUDDY AMIANTH.

Rude lumps | hard | heavy

6. GREEN AMIANTH.

Large, flatted masses | tender | heavy

unevenly streak'd

WHITISH

swims in water

Sweden

Amiantus Implexus, L.

irregular

REDDISH

sinks in water

Germany

Byssus Martialis Cronstedt.

wav'd

DULL GREEN

sinks in water

Sweden

Byssus Virescens Cronstedt.

a copper ore.

# ASBESTINE FOSSILS.

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## ORDER III.

### CARYSTINES.

#### CARYSTIA.

Composed of flaky plates, formed of inseparable, tough fibres.

**T**HESE are in their original, fibrous, as well as the preceding kinds; but the fibres are formed into small flat flakes; and these flakes again into larger masses of the same form and kind. These are tough, flexible, and light; and to a stranger would appear rather of animal, or vegetable, than of Fossil origin. But the place where they are found, their structure when examined with glasses, and their resisting the force of fire, shew clearly what they are.



FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. LEATHER CARYSTINE.							
Flat membranes in cracks of rocks	soft	very light	like flannel	YELLOWISH GREY	swims on water	Sweden	Amiantus Aluta. L.
2. FLESHY CARYSTINE.							
Thick, flat cakes	soft	light	undulated	WHITISH	swims on water, very flexible	Germany	Amiantus Caro Montana. L.
3. CORK CARYSTINE.							
Broad masses	soft	light	uneven	RUDDY BROWN	soaks in the water, and then sinks	Saxony	Amiantus Suber L.
4. YELLOW CARYSTINE.							
Great flakes	tender	heavy	wav'd	OCHREOUS YELLOW	sinks in water	Sweden	Caro Montana Flavicans Cronstedt.

## NATIVE FOSSILS.

## CLASS VIII.

## EARTHS.

## TERRÆ.

Fossils composed of imperceptible particles, united into firm, but not hard masses.

THE Earths are a numerous tribe; but they have been supposed more numerous than they are: Sands have been counted among them, which are not of their nature, nor answer to their common character.

They are very important in their uses to mankind; and therefore worthy a place in all cabinets; tho' they add little to their beauty.

There are five principal kinds of Earths:

- |            |  |            |
|------------|--|------------|
| 1. CLAYS,  |  | 4. MOULDS, |
| 2. CHALKS, |  | 5. BOLES,  |
| 3. MARLES, |  | 6. OCHRES. |

These serve for purposes perfectly various; and are in their nature evidently distinct; and easily distinguishable by their characters.

Two are primitive Fossils, Chalk, and Clay; Mould is perfectly adventitious, and variously mixed; Marles have animal remains; and Boles and Ochres have always a metallic mixture: the Alkaline Earths (here called Chalks, for the sake of a shorter name) have been supposed of animal origin; and they are now received as such; but the matter does not appear thus to me. I must be indulged in the use of my own experience; but the reasons of my doubts will be seen, and may be judged by all.

Earths are tender, tho' compact; they may be rubb'd to pieces in the hands, tho' some more difficultly than others: they disunite in water, but do not dissolve in it.



## E A R T H S.

ORDER I.

## C L A Y S.

## A R G I L L Æ.

Tough, ductile, heavy, smooth masses.

**T**HE distinctions of Fossils are all relative: but they become absolute when viewed in comparison with the other bodies of the same kind: so these four words comprehend a character of Clay, by which it will be distinguished at sight from all other kinds of Earths.

This Distinction of an Earth from other Earths is all that should be attempted in the character of an Order.

The difference of Earths from other Fossils is given in the character of the Class.

Linnæus describes Clay as a precipitation of a tough sea-water. 'Tis well we need not enquire minutely into this; for it would not bear such enquiry.

Wallerius tells us, Clays are form'd of cubic particles. This we ought to enquire into; and I am sorry to say, we do not find it so. I wish it were; 'twould be a great natural distinction.

If we would lay down the Earths as Cronstedt, we must take in the Spars, the Crystals, Talcs, and even the Gems. Yet this was right in him, whose work was destin'd to the use of miners. Let me not seem to blame authors, where I decline adopting their opinions. These deserve respect, nay, reverence, all of them; but men are not infallible: and if one work were perfect, we need not labour after more.

All Clays look dull when broken; all soften and become unctuous in water; and all harden in the fire.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. WHITE CLAY.							
Vast strata, deep	very tough	very heavy	very ductile	PURE WHITE	unctuous	Isle of Wight	Argilla Apyra. L. tobacco pipes.
2. GREY CLAY.							
Vast strata	tough	heavy	ductile	GREYISH	fatty	Germany	Argilla Leucargilla. L. tobacco pipes.
3. PURPLE CLAY.							
Thin strata	very tough	heavy	very ductile	PALE VIOLET- COLOUR	unctuous	France	Argilla Violacea. L. furnaces.
4. BLACK CLAY.							
Deep, thick strata	tough	very heavy	less ductile	BLACK	grows white in the fire	Montmartre	Argilla Nigra. L. tobacco pipes.



5. BLUE CLAY.

Vaſt ſtrata

very tough

heavy

very ductile

LEAD COLOUR

reddens in the fire

Leiceſterſhire

tiles.

Argilla [Communis. L.

6. POT CLAY.

Vaſt ſtrata

tough

heavy

ductile

GREY

reddens in the fire

Warwickſhire

pots and pans.

Argilla Figulina. L.

7. PORCELANE CLAY.

Vaſt ſtrata

brittle

heavy

not very ductile

WHITE, WITH SPANGLES

dry

China

porcelane.

Argilla Porcellana. L.

8. YELLOW CLAY.

Vaſt ſtrata

brittle

very heavy

ductile when wet

YELLOW, WITH SPANGLES

dry

China

coarſe porcelane.

Argilla Chinenſis.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
9. LEMON CLAY.							
Vaſt ſtrata	tough	heavy	very ductile	VERY PALE YELLOW	unctuous	Tartary	great pipe heads. Argilla Lithomarga. W.
10. DUSKY CLAY.							
Vaſt ſtrata	tough	heavy	very ductile	BROWNISH YELLOW	fatty, but coarſe	England	bricks. Argilla Sterilis. L.
11. RED CLAY.							
Thin ſtrata	brittle	heavy	ductile	PALE RED	dry	Sweden	Argilla Incarnata. L.
12. GREEN CLAY.							
Thin ſtrata	crumbly	light	not very ductile	COARSE GREEN, WITH SPANGLES	duſty	Ægypt, Germany	Argilla Talcoſa. L.



<p>13. TAWNY CLAY.</p>	<p>Vaſt ſtrata</p>	<p>ſpongy</p>	<p>heavy</p>	<p>not very ductile</p>	<p>REDDISH YELLOW</p>	<p>fandy</p>	<p>Wiltſhire</p>	<p>poor pottery.</p>	<p>Argilla Tumefcens. L.</p>
<p>14. DARK CLAY.</p>	<p>Vaſt ſtrata</p>	<p>hard</p>	<p>heavy</p>	<p>crumbly</p>	<p>DEEP BROWN</p>	<p>full of ſmall gra- vel</p>	<p>Worceſter- ſhire</p>	<p>for ovens.</p>	<p>Argilla Grandæua. L.</p>
<p>15. STAINING CLAY. UMBER.</p>	<p>Great maſſes</p>	<p>brittle</p>	<p>light</p>	<p>crumbly</p>	<p>DUSKY BROWN</p>	<p>ſtains the fingers</p>	<p>Italy</p>	<p>for painting.</p>	<p>Argilla Umbra. L.</p>
<p>16. ÆGYPTIAN CLAY.</p>	<p>Vaſt cakes</p>	<p>brittle</p>	<p>heavy</p>	<p>crumbly</p>	<p>LIGHT BROWN</p>	<p>duſty</p>	<p>Ægypt</p>	<p>a manure.</p>	<p>Argilla Nilotica. L.</p>

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
17. UNDERBOG CLAY.							
Thick strata	tough	heavy	ductile	BLACKISH	styptic	Ireland	Argilla Vitriolica, L.

I have taken the Linnæan trivial names for Clays; for no author has understood their characters so clearly and distinctly: but the list is smaller here; for his 6th, 8th, and 14th, are Boles; his 7th, 17th, and 20th, Marles. These will be found in their places; but excepting for this mixture, which my specimens, and my experiments disclaim, his distinctions are excellent: and 'tis the purpose here to give, that author's names, who appears to have understood the particular body best; to use not one, but all; and give a short direction where 'tis best to seek farther accounts, than the nature of this work admits.

## E A R T H S.

### O R D E R II.

#### C H A L K S.

##### C R E T Æ.

Dry, dusty, light, brittle, staining masses.



FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. PURE CHALK.							
Vast strata	hard	heavy	compact	WHITE	hardest, as deepest	England	for lime.  Calx Creta. L.
2. DUSTY CHALK.							
Vast masses	crumbly	heavy	brittle	WHITE	foul with stones	Sweden	a manure.  Calx Marmorae. L.
3. YELLOW CHALK.							
In great masses	brittle	heavy	duffy	YELLOWISH	foul with stones	Sweden	a manure.  Calx Marmorae Flavae L.
4. RUDDY CHALK.							
Vast lumps	hard	very heavy	brittle	REDDISH	sandy	Forest of Dean	lime.  Calx Marmorae Rubrae L.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USE.
5. AGARICK CHALK.							Calx Palustris. L.
Flat, great cakes	soft	light	friable	PURE WHITE	stainy	Sweden	white washing.
6. MOON CHALK.							Calx Guhr. L.
Great lumps, deep in rocks	very soft	very light	very brittle	PURE WHITE	stainy	Germany	an absorbent.
7. RED CHALK.							Creta Rubens. W.
Large, rude masses	hard	very heavy	brittle	FINE RED	stains	Germany	for painting.



# E A R T H S.

## O R D E R III.

### M A R L E S.

Tender, crumbly, light, coarse masses.

27

F O R M.	H A R D N E S S.	W E I G H T.	S U R F A C E.	C O L O U R.	Q U A L I T I E S.	P L A C E.	U S E S.
I. W H I T E M A R L E. Vaſt ſtrata	foft	light	very crumbly	P U R E W H I T E	breaks ſwiftly in water	England	manure.
2. S A L I N E M A R L E. Vaſt looſe ſtrata	brittle	heavy	crumbly	B R O W N	ſalt taſte	Palæſtine	Argilla Muriatica. L.

Argilla  
Marga.  
L.

Argilla  
Muriatica.  
L.

FORM.	HARDNESS.	WEIGHT,	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
3. CHINA MARLE. Vaſt maſſes	compact	heavy	coarſe, and uneven	LIGHT GREY	full of ſpangles	China	Terre à Porcelane, W.  porcelane.
4. CHALKY MARLE. Vaſt ſtrata	firm	heavy	uneven	YELLOWISH WHITE	cleanſing for woollen.	Greece	Marne Cretacee, W. for the fullers.
5. FULLER'S MARLE. FULLER'S EARTH. Vaſt maſſes	ſoft	heavy	irregular	OLIVE- BROWN	moſt unctuous	England	Argilla Fullonica, L. for clothiers.
6. WHITE FULLER'S EARTH. Thick ſtrata	hard	heavy	gloſſy	GREYISH WHITE	ſoft	Germany	Smeſtis Grifea, W. for cloaths.



7. RED MARLE.

Deep strata hard

light

rugged

RED

breaks easily in water

England

manure.

Marne. Rouge. W.

8. BROWN MARLE.

Vast strata tender

light

uneven

BROWN, MIXED WITH GREY AND YELLOW

breaks freely

England

manure.

Marga Fulca. W.

9. DOVE MARLE.

Vast strata hard

heavy

rough

DOVE COLOUR, WITH RED AND BROWN SPOTS

breaks freely

England

manure.

Marga Columbina. W.

10. YELLOW MARLE.

Deep strata tender

light

duffy

DEAD YELLOW

breaks freely

England

manure.

Marga Flava. W.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
II. BLUE MARLE *							Marga Cerulea. W.
Vast strata	hard	heavy	shattery	DEADBLUE, SIMPLE, OR VEIN'D	breaks slowly	England	manure.
III. BLACK MARLE.							Marga Nigricans. W.
Great masses	tender	heavy	crumbly	BLACK	breaks freely	England	manure.
IV. STEEL MARLE.							Marga Ferreæ.
Great lumps	hard	light	shattery	DEEP GREYISH	breaks in dice	England	manure.
V. PAPER MARLE.							Marga Papyracea.
Thin flakes	soft	light	fibille	PALE GREY	splits into leaves	England	manure.



15. SCALY MARLE.	Deep strata	soft	light	brittle	WHITE	splits	Holland	manure.	Marga Tefacea. L.
16. SHELL MARLE.	Thick strata	tender	light	very brittle	WHITISH	crumbly	England	manure.	Marga Conchacea. L.
17. SAND MARLE.	Vaft strata	hard	heavy	ftony	PALE BROWN	firm	England	manure.	Marga Lapidifica. W.
18. CLUSTER MARLE.	Vaft lumps	tender	light	rugged	DEEP BROWN	crumbly	Holland	manure.	Marga Tophacea. W.

\* There is evidently, Clay in this Marle; and Cronstedt has great reason on his fide, when he calls Marle a mixture of calcarious and clayey Earth.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
19. DENDRITE MARLE.							Marga Dendrites, W.
Thin strata	hard	heavy	uneven	PALE GREY	mark'd with figures of moffes	Germany	manure.
20. SHELL MARLE*.							Marga Immatura.
Vaft strata	tender	light	rugged	BROWN, AND WHITE	full of shells	Woolwich	manure.

\* Many of the Marles have frequently Shells in them; but this is almost composed of them. 'Tis a doctrine, that all Marles are formed of decayed Shells; and this is, by those authors, fupposed yet imperfect, or unripe: but there are Marles that have nothing shelly in them.

## E A R T H S.

### O R D E R IV.

#### M O U L D S.

Impure, crumbly, light, mixt Earths.



FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. PURE MOULD. A loose duft	tender	very light	smooth	PALE BROWN	impalpa- ble	every where	the food of ve- getables.  Humus Dedalaria, L.
2. DUSKY MOULD. A coarse duft soft		light	uneven	DEEP BROWN	granulated	every where	the bed of plants.  Humus Ruraris, L.
3. LAKE MOULD. Deep beds very soft		heavy	smooth	BLACKISH	impalpa- ble	under water	rich manure.  Humus Lacustris Lutum, Cronstedt, L.
4. RED MOULD. Thick strata tender		heavy	rugged	DUSKY RED	crumbly	Northamp- tonshire	rich land.  Terra Adamica, W. Humus Damascena, L.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
5. HEATH MOULD. Deep beds	hard	light	uneven	DEAD BROWN	barren	on heaths	none. <i>Humus Pauperata.</i> L.
6. LOOSE MOULD. superficial beds	tender	light	uneven	BLACKISH	swelling with wet	in gardens	throws up roots <i>Humus Effervescens.</i> L.
7. DINGY MOULD. Deep beds	tender	light	smooth	UMBER- COLOUR'D	wet	on mountains	bed of Alpine plants <i>Humus Alpinae.</i> L.
8. TURF MOULD. Deep beds	tender	light	rugged	RUDDY BROWN	mixt with roots and bitumen	in bogs	for firing. <i>Humus Turfae.</i> L.



9. IRON MOULD.

Thick beds tender

heavy

smooth

INKY

vitriolic

Sweden

for dying black.  
Humus Tinctoria.

10. BLACK MOULD.

Superficial strata tender

heavy

rugged

DEEP BLACK

hardens in air

England

a rich land.  
Humus Picea. L.

11. SLATE MOULD.

Superficial strata hard

heavy

plated

RUDDY BROWN

fiffile

England

an alum ore.  
Humus Schistosa. L.

12. STAINING MOULD.

Great lumps soft

light

crumbly

BLACK

stains like chalk

Sweden

for colouring.  
Humus Nigrica. L.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
13. RAVEN EARTH. Great masses	hard	heavy	uneven	RAVEN GREY	crumbly	Sweden	Humus Lenticularis. L.
14. ANIMAL EARTH. Dust	soft	light	even	BROWN	tender	church-yard	Humus Animalis. L.

E A R T H S.

O R D E R V.

B O L L E S.

Smooth, soft, heavy, unctuous, tender masses.



FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. WHITE BOLE ARMENIC.							<p>Artilla Bolus. L. Bolus Alb. H.</p> <p>a medicine for fluxes.</p>
Thick lumps	firm	very heavy	polished	PURE WHITE	melts in the mouth	Armenia	
2. BRITTLE WHITE BOLE.							<p>Bolus Friabilis, H.</p> <p>a medicine for poison.</p>
Thin strata		heavy	duffy	WHITE	unctuous	Germany	
3. GREY BOLE.							<p>Bolus Eretria, H. Bol Gris. W.</p> <p>a medicine.</p>
Vast masses	hard	heavy	smooth	GREYISH WHITE	crumbly	Greece	
4. YELLOW BOLE ARMENIC.							<p>Bolus Armena Galen. H.</p> <p>a medicine for fevers.</p>
Thick strata	tender	heavy	polished	PALE YELLOW	melts in the mouth	Greece	

A 2 2

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
5. BOLE OF BLOIS. Thick masses	soft	light	dufty	GOOD YELLOW	melts in the mouth	Blois and Tokay	an astringent.  Bulus Blesensis. H.
6. YELLOW LEMNIAN EARTH. Thick cakes	very hard	heavy	dufty	FULL YELLOW	breaks in flakes	Greece	an astringent.  Terra Lemnia Flava. H.
7. ORANGE BOLE. Thick cakes	tender	light	smooth	REDDISH YELLOW	melts in the mouth	Livonia	for fevers.  Terra Sigillata* Livonica Lutea. H.
8. RED BOLE ARMENIC. Deep strata	very hard	heavy	dufty	DEEP YELLOWISH RED	sticks to the tongue	Armenia	for fluxes.  Bulus Rubra Durissima. H.



9. RED FRENCH BOLE.	Thick strata	tender	very heavy	rough	PALE RED, WITH YEL- LOW VEINS	gritty	near Paris	for fluxes.	Bolus Rubra Gallica. H.
10. STRIGA EARTH.	Thick strata	tender	light	dufty	DULL RED	brittle	Hungary	for fevers.	Terra Sigillata Strigonicis. H.
11. TUSCAN BOLE.	Vaft maffes	friable	very heavy	irregular	PALE RED	gritty	Tufcany	for fevers.	Terra Sigillata Rubra Magni Ducis. H.
12. RED LEMNIAN EARTH.	Thick strata	very hard	heavy	polished	DEEP RED	melts in the mouth	Greece	for fevers.	Terra Lemnia Rubra. H.

\* Many of these medicinal Earths come to us, seal'd; and there have been thought to be more than there really are: these seem, on a careful enquiry, to be all the truly distinct kinds.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
13. AMERICAN BOLE.							Bolus Rubescens. H.
Vast lumps	very hard	heavy	uneven	FLESH-COLOUR'D	melts in the mouth	Virginia, and Carolina	astringent.
14. TRIPELA.							Argilla Tripolitana. L.
Thin strata	hard	light	duffy	PALE RED	harsh, and gritty	Naples	for scouring.
15. BROWN BOLE.							Bolus Fulvus. H.
Large cakes	firm	heavy	smooth	PALE BROWN	melts in the mouth	Goffelaer	an astringent.
16. GREEN BOLE.							Bolus Virescens. H. Bolus Viridis. W.
Small lumps	tender	very heavy	polished	DUSKY GREEN	melts in the mouth	Cornwall	astringent.



Le Bol  
Noir.  
W.

astringent.

Bolus  
Squamosa  
Cronstedt.

an iron ore.

Germany

Sweden

bitumi-  
nous

green,  
when  
powder'd

PERFECTLY  
BLACK

BLACKISH

glossy

rough

heavy

heavy

17. BLACK BOLE.

Vast lumps  
very hard

18. DUSKY BOLE.

Thin cakes  
hard

E A R T H S.

O R D E R V.

O C H R E S.

Dry, dusty, staining; fine masses.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. DUSTY WHITE OCHRE.							
Small pieces	friable	very heavy	duffy	PURE WHITE	crumbly	Sweden	a lead ore. Ochra Plumbi. L.
2. FIRM WHITE OCHRE.							
Small lumps	hard	very heavy	smooth	WHITE	stains the hands	Germany	a Zink ore. Ochra Zinci. L.
3. YELLOW OCHRE.							
Thin strata	soft	light	duffy	BRIGHT YELLOW	crumbly	England	a paint. Ochra Ferri. L.
4. TAWNY OCHRE.							
Great masses	tender	very heavy	uneven	TAWNY YELLOW	brittle	Sweden	a paint. Ochra Cobalti. L.



5. GOLD OCHRE.

Thin masses

light

rugged

BRIGHT  
YELLOW

crumbly

England

a paint.

Ochra  
Theophrasti.  
H.

6. SAFFRON OCHRE.

Flat cakes

light

uneven

SAFFRON  
YELLOW

flaky

Northamp-  
tonshire

a paint.

Ochra  
Attica.  
H.

7. NAPLES OCHRE.

Large lumps

heavy

rugged

FINE  
YELLOW

crumbly

Italy

a paint.

Ochra  
Giallolina.  
H.

8. RED OCHRE.

Vast cakes

very  
heavy

uneven

STRONG  
RED

crumbly

England

a coarse paint.

Ochra Sil  
Syracusan  
H.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
9. PURPLE OCHRE.							
Great lumps	tender	very heavy	dufty	PURPLISH RED	friable	Spain	Ochra Sil Atticum. H. a paint.
10. CRIMSON OCHRE.							
Great cakes	hard	extreamly heavy	uneven	DEEP PURPLISH CRIMSON	gritty	Isle of Ormuz	Ochra Purpurea. H. a paint.
11. VENETIAN OCHRE.							
Great cakes	tender	light	dufty	PALE RED	perfectly pure	Venice	Ochra Veneta. H. a paint.
12. SINOPIC OCHRE.							
Thick masses	compact	very heavy	smooth	DEEP RED	soft to the touch	Greece	Ochra Sinopica. H. a paint.



13. RED CHALK OCHRE.

Great masses very hard heavy

14. MARBLE OCHRE.

Great masses stony hard heavy

15. RUSTY OCHRE.

Small cakes tender very heavy

16. GRAIN'D RED OCHRE.

Small lumps soft very heavy

Ochra  
Creta Rubra.  
H.

a paint.

Italy

unctuous

GOOD RED

polished

Ochra Sil  
Marmorofum.  
H.

a paint.

China

dufty

STRONG  
RED

uneven

Ochra  
Cupri.  
L.

a copper ore.

Sweden

green,  
when  
dissolv'd

RUST CO-  
LOUR,  
BROWN,  
RED

rough

Ochra  
Ferrugo.  
L.

a paint.

Sweden,  
in iron mines  
and on iron

granulat-  
ed, and  
thready

RUSTY RED

rugged

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
17. STREAKY RED OCHRE.							
Small lumps	tender	heavy	fibrous	PALE RED	plumose	France	a paint. Ochra Stibigo. L.
18. GREEN OCHRE.							
Small maffes	friable	light	granulated	GOOD GREEN	duffy	Germany	a paint. Ochra Ærie. L. Ochra-Chryfocolla. H.
19. CHRYSOLITE OCHRE.							
Rough lumps	brittle	heavy	uneven	YELLOWISH GREEN	green, when diffolv'd	Sweden	a paint. Ochra Nickeli. L.
20. FIBROUS GREEN OCHRE.							
Small maffes	tender	light	rugged	PALE GREEN	crumbly	Virginia, on copper ore	a paint. Ochra Ærugo. L.



21. SOFT BLUE OCHRE.

Great lumps

friable

heavy

dufty

LIGHT  
BLUE

diffes in  
water

Germany

a paint.

Ochra Lapis  
Armenus.  
H.

22. HARD BLUE OCHRE.

Small lumps

hard

heavy

polished

GOOD  
BLUE

earthy

Sweden

a paint.

Ochra  
Cupri.  
L.

23. STRIATED BLUE OCHRE.

Great lumps

tender

very  
heavy

rugged

FINE BLUE

fibrose

Germany

a paint.

Ochra  
Cuprigo.  
L.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
24. BLACK OCHRE. Great masses	tender	light	uneven	BLACKISH	crumbly	Leicester-shire	Ochra Magnesia. L. a paint.
25. FIBROSE BLACK OCHRE. Small lumps	hard	very heavy	streaky	DEEP BLACK	thready	Saxony	Ochra Argentiga. L. a silver ore.
26. BLACKISH TRIPELANE OCHRE. Great masses	hard	heavy	uneven	BLACKISH, OR BROWN	dufty	Warwick-shire	Ochra Tripela Fusca. H. for polishing.



## P A R T II.

## COMPOUND FOSSILS.

Form'd by mixture of two, or more of  
the Native, Earthy kinds.

---

 C L A S S I.

## S E M I - P E L L U C I D G E M S.

Hard, heavy, rounded masses: rude on the surface,  
smooth where broken, and composed of impercep-  
tible particles.

THESE do not ferment with Acids: they strike  
fire with steel, and they take a delicate polish.

They all encrease in weight by calcination; in the  
manner of Lead, and some other metals. 'Twas Hen-  
ry first astonished the world with this account: and  
on repeated trials, I have found it true, but in va-  
rious degrees.

They all run in the fire, and make glafs; to this  
purpose those serve best which have least colour, or  
are nearest to pure Crystal. Cronstedt says, there  
are kinds which make a glafs, that is injured by Acids;  
and those so weak, as what are in the Rhenish and  
Moselle wines.

# COMPOUND FOSSILS.

## ORDER I. OPALS.

Uniform, almost pellucid, varying the shades of colours with the light.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. PURE OPAL.							
Small lumps	hard	heavy	raised in lumps	PALE, AND CHANGE-ABLE	almost transparent	India, Ægypt	Silex Opalus. L. ornament.
2. WHITE OPAL.							
Larger lumps	soft	light	uneven	MILKY, AND CHANGE-	opaque	Arabia	Opalus Albus. Cronstedt. ornament.



3. OLIVE OPAL.

Small masses hard

heavy

tuberous

PALE  
BROWN,  
CHANGE-  
ABLE

red, when  
seen thro'

Ægypt

Opalus  
Pæderota  
Cronstedt.

ornament.

4. YELLOW OPAL.

Larger lumps tender

heavy

rugged

YELLOWISH,  
A LITTLE  
CHANGE-  
ABLE

ruddy,  
when seen  
thro'

Saxony

Opalus  
Flavescens.  
W.

ornament.



5. BLACK OPAL.

Small masses hard

heavy

glossy

COAL  
BLACK,  
CHANGE-  
ABLE, WITH  
YELLOW

obscure

East Indies,  
Germany

Opalus  
Niger.  
W.

ornaments.

6. CAT'S EYE.

Rugged lumps hard

light

raised in  
bumps

YELLOWISH,  
CHANGE-  
ABLE, WITH  
WHITISH

obscure

Ceylon,  
Siberia

Silix  
Pseudoopalus.  
L.

ornaments.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. WORLD'S EYE.							Silex Oculus Mundi. L.
Small masses	hard	heavy	irregular	GREYISH, BROWN	transpa- rent, in water	East Indies	ornament.

# COMPOUND FOSSILS.

## ORDER II.

### ONYXES.

Plated, opaque, variously coloured, in distinct beds.



FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. ARABIAN ONYX.							
Small lumps	hard	heavy	warted	BLUEISH GREY	beds of black and white	East Indies	rings.  Onyx Cornuus. W.
2. BROWN ONYX.							
Larger lumps	hard	heavy	tabulated	GREY	beds of dead brown	Conanor	ornaments.  Onyx Circulis Fufcis. W.
3. CAMÆAN ONYX.							
Small lumps	hard	heavy	tily	BLACK, AND WHITE	separate thick beds	East Indies	for engraving gems.  Onyx Memphites. W.
4. SARDONYX.							
Small lumps	hard	heavy	undulated	RUDDY, BROWNISH	beds of white	Ægypt	for gems.  La Sardonyx. W.

C  
C  
N

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
5. SIBERIAN ONYX.							Onyx Carnea Crowned.
Small lumps	very hard	heavy	uneven	GREY	veins of flesh- colour	river Tomim, Siberia	ornaments.

# COMPOUND FOSSILS.

## ORDER III.

JASPONYXES.

Opake of various colours, in thick veins, blotches, or spots: not in plates.



FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. CLOUDED JASPONYX.							
Large lumps	hard	heavy	wav'd, and warty	PALE RED	grey, cloudy within	Arabia	boxes.
2. SPOTTED JASPONYX.							
Small maffes	tender	heavy	rugged	DULL GREEN	spots of pale red	Ægypt	snuff boxes.

Jasponyx Capnias. W.

Jasponyx Mouchette. W.

# COMPOUND FOSSILS.

## ORDER IV.

CHALCEDONY.

Dusky, clouded, and mixed of various colours.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. GREENISH CHALCEDONY.							
Little lumps	very hard	heavy	coated	GREYISH GREEN	uneven veins	Ægypt	Silex Chalcedonius. L. snuff boxes.
2. BROWN CHALCEDONY.							
Large lumps	hard	heavy	wav'd	BROWNISH GREY	clouded	Ægypt	Chalcedonius Griseo Spadicceus. W. ornament.
3. RAINBOW CHALCEDONY.							
Small masses	soft	heavy	botryoide	BLUEISH GREY	red, green, yellow rainbows	East Indies	Chalcedonius Griseo Cærulefcens. W. toys.
4. MILK CHALCEDONY.							
Great lumps	soft	heavy	scaly	MILKY	thin clouds of grey	Tartary	Chalcedonius Cocholong Cronfledt. for idols.



5. BLUE CHALCEDONY.	Large lumps	hard	heavy	wavy	GREYISH BLUE	unspotted	Ceylon, Siberia	Chalcedonius Cæruleus Cronstedt. ornament.
6. LINEATED CHALCEDONY.	Large lumps	hard	heavy	warted	YELLOWISH	spots of all lines and colours	East Indies	Chalcedonius Lineatus, W. ornament.

# COMPOUND FOS SILS.

## ORDER V.

### CARNELIANS.

Tolerably pellucid, pure, or veined in circles, not in beds.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. RED CARNELIAN.							
Large lumps	hard	heavy	crusted	PALE RED	without veins	Arabia	toys. Silex Carneolus, L.
2. WHITE CARNELIAN.							
Large lumps	hard	heavy	smooth	MILKY WHITE	cloudy	Ægypt	toys. Carneolus Albescens, W.
3. YELLOW CARNELIAN.							
Small masses	tender	heavy	warted	AMBER- COLOUR'D	dufky	Ægypt	toys. Carneolus Flavescens Cronstedt.
4. BROWN CARNELIAN.							
Small lumps	hard	heavy	crusted	PURE BROWN	cloudy	Siberia	toys. Carneolus Flavofuscus Cronstedt.



5. BLOODY CARNELIAN.

Beryllus  
Scheukzer.  
W.

Small lumps | very hard | heavy

East Indies

clear

DEEP RED

smooth

a jewel.

6. DOTTED CARNELIAN.

Carnoolus  
Stigmatites.  
W.

Small lumps | very hard | heavy

East Indies

spots of  
blood red

WHITISH  
RED

warted

ornament.

7. VEINY CARNELIAN.

Carnoolus  
Lineatus.  
W.

Small lumps | tender | light

Arabia

veins of  
deep red

PALE RED

smooth

ornament.

# COMPOUND FOS SILS.

## ORDER VI.

### AGATES.

Clear, hard, veined, flinty, and rugged on the surface.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. GREY	AGATE.	heavy	raised in round bumps	GREY	veins of black and white	Germany	Achates Durissima. W. for toys.
Large lumps	very hard						
2. BROWN	AGATE.	very heavy	warted	DEEP BROWN	vein'd with grey and white	Italy	Achates Fulca. W. for toys.
Small lumps	very hard						



3. MILK AGATE.

Large lumps hard

heavy

concentric circles of white

Africa

for toys.

Achates  
Chalcedonians  
Cronstedt.

4. BLACK AGATE.

Small lumps hard

very heavy

keeps its colour in the fire

Germany

toys.

Achates  
Niger.  
W.

5. DOTTED AGATE.

ST. STEPHEN'S GEM.

Small masses soft

very heavy

red dots, and streaky

Italy

toys.

Siler  
Sardus.  
L.

6. TAWNY AGATE.

Large lumps hard

heavy

undulated

Germany

toys.

L'Agate  
Leontine.  
W.

FOR M.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
7. HYENA AGATE.							L'Agate Hyane. W.
Large lumps	hard	heavy	rugged	OLIVE BROWN	smoaky	Germany	toys.
8. PANTHER AGATE.							L'Agate Peurtherc. W.
Large lumps	very hard	heavy	grape like	YELLOWISH	dusky spots	Palatinate	toys.
9. WHITE VEIN'D AGATE.							Achates Variegatus Cronstedt.
Large masses	very hard	heavy	bubbly	DEEP BROWN	white veins	Hartz forest	toys.
10. VIOLET AGATE.							Achates Vioaceus Cronstedt.
Small lumps	hard	heavy	warted	VIOLET PURPLE	dusky veins	Germany	toys.



11. BLOOD AGATE.

Small lumps foft heavy

bumps, and rifings

BLACK

blood red spots

Germany

toys.

Achates  
Haemachates.  
W.

12. FLESH AGATE.

Small lumps hard heavy

waved

GREY

flesh-colour'd spots

Oberstein

toys.

Achates  
Sardachates.  
W.

13. GREEN AGATE.

Large lumps foft heavy

warted

PALE  
GREEN

red spots

Germany

toys.

Achates  
Jaipachates.  
W.

14. ORANGE AGATE.

Large lumps hard very heavy

crusted, and rough

DUSKY  
YELLOW

black, red, and green veins

Germany

toys.

Achates  
Quadricolor.  
W.

# COMPOUND FOSSILS.

## ORDER VII.

### M O C C O A S.

Semipellucid, smooth, very hard, with black delineations.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. CLEAR M O C C O A.							
Small lumps	very hard	heavy	smooth	COLOUR- LESS	with black mosses	East Indies	L'Agate Coralline. W. ornament.
2. BROWN M O C C O A.							
Small lumps	hard	heavy	uneven	P A L E B R O W N	figures of trees	East Indies	Dendraches Woodward. ornaments.



3. WHITE MOCOCA.

Small lumps

hard

heavy

botryoid

WHITISH,  
OR  
MILKY

forms of  
silver ores

Germany \*

ornament.

Achates  
Mocoensis.  
W.

\* Wonders have been related of these Mocoas; but they have been fictitious: we have been astonished with the forms of sun, moon, and stars; the shapes of Insects, the arms of nations, and, even human figures: but when we know that a solution of silver will follow a tool, and give any delineations we please on Stones, of this quality, we find the origin of these more than natural productions. Mocoas may be made thus, with pretty figures, like the natural, as well as with romantic follies; and 'tis strange, that when the lines decay, and begin to disappear, laying the Stone in the sunshine recalls them.

Linnaeus does not distinguish the Mocoas from the Agate; and Wallerius enumerates those with forms of crowns, and human figures, and the like: but the fact is, the Mocoas differs from the Agate; for it is harder; but the colours of the Stone, not the delineations, are to mark the different kinds.

COMPOUND FOS SIL S.

ORDER VIII.

SWALLOW STONES.

Small, rounded, or oval, smooth.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. CONVEX SWALLOW STONE.							
Low raised	tender	heavy	polished	PALE BROWN	concave below	Germany	Hirondelle Concave. W.
2. HIGH SWALLOW STONE.							
Raised high	hard	heavy	botryoide	WHITISH	hæmi- sphere	Saxony	Hirondelle Demisphérique. W.
3. CRAB'S EYE SWALLOW STONE.							
Oval	hard	heavy	polished	GREY	in lumps of Agate	Germany	Hirondelle Ovale. W.
4. CORNER'D SWALLOW STONE.							
Square	soft	light	rugged	MILKY	hollowed below	Germany	Hirondelle Quarré. W.



## COMPOUND FOS SILS.

ORDER IX.

## JASPER S.

Opake, rough, in vast masses.

## I. PLAIN JASPER S.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. GREY Vast masses	JASPER. hard	very heavy	rugged	DULL GREY	breaks like flint	Sweden	Silex Jaspis. L.
2. WHITE Great masses	JASPER. very hard	heavy	uneven	FINE BLUEISH WHITE	polishes finely	Germany	Petroflex Albus, W.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
3. RED Great pebbles	JASPER. hard	heavy	even	RED	glossy	gravel pits in England	Homochroum Rubens. H.
4. YELLOW Vaft blocks	JASPER. very hard	heavy	rugged	PALE YELLOW	sparkling	Hampstead- heath	Jaspis Flava. W.
5. IRON Rounded lumps	JASPER. hard	very heavy	smooth	BRIGHT IRON GREY	flinty	Germany	Jaspis Martialis Cronstedt.
6. BROWN Rugged lumps	JASPER. very hard	very heavy	wrinkled	DEAD BROWN	shining	Sweden	Jaspis Spadicea. W.



Jaspis  
Aetizufa  
Plini.

Homochroum  
Virefcens.  
H.

Jaspis  
Nigra  
Cronstedt.

Jaspis  
Virens  
Cronstedt.

7. BLUE JASPER. Rounded lumps	hard	very heavy	glossy	FINE BLUE	flinty	Italy
8. GREEN JASPER. Rounded lumps	hard	heavy	smooth	DULL GREEN	marbly	Suffex
9. BLACK JASPER. Vast rocks	very hard	heavy	uneven	PERFECTLY BLACK	stony	Germany, Sweden
2. VEIN'D JASPER S.						
10. GREEN AND YELLOW JASPER. Small masses	hard	very heavy	smooth	GOOD GREEN	yellow spots	Bohemia

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
II. BLOODSTONE JASPER.							
Small lumps	hard	heavy	smooth	BLUEISH GREEN	blood red spots	Ægypt	Jaspis Heliotropium Cronstedt.
12. YELLOW AND WHITE JASPER.							
Great blocks	very hard	heavy	crack'd, and flaw'd	PEARLY WHITE	yellow blotches	Germany	Jaspis Variegata Albescens. W.
13. RED AND BLACK JASPER.							
Large lumps	hard	very heavy	raised in bumps	BLOOD RED	green and black spots	Italy	Diaspro Rosio Cronstedt.
14. RED AND YELLOW JASPER.							
Small blocks	very hard	heavy	perfectly even	DUSKY RED	yellow veins and spots	Ægypt	Diaspro Florido Cronstedt.



15. BROWN AND WHITE JASPER.

Large lumps | hard | very heavy

16. PANTHER JASPER.

Great lumps | less hard | heavy

17. GARAMANTINE JASPER.

Small lumps | very hard | heavy

18. AZURE JASPER.

Small lumps | hard | heavy

Jaspis  
Variegatufusca.  
W.

Germany

white  
blotches

PALE  
BROWN

uneven

Jaspis Variegata  
Viridis.  
W.

Germany

yellow  
and red  
blotches

GREEN

uneven

Jaspis Lineis  
Albis.  
W.

Ægypt

white  
blotches

DEEP RED

gloffy

Lapis  
Lazuli.  
W.

Arabia

yellow and  
white  
veins and  
spots

FINE BLUE

crack'd

a copper ore.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
19. ARMENIAN JASPER.							
Small masses.	less hard	heavy	smooth	LIGHT BLUE	white spots	Ægypt	Lapis Armenus, W.
20. SAPPHIRINE JASPER.							
Small masses	hard	heavy	glossy	DEEP BLUE	gold dots	East Indies	Lapis Radians, W.
<b>3. ROCK JASPER S.</b>							
21. BROWN ROCK JASPER.							
Whole strata	hard	very heavy	rugged	PALE BROWN	flinty	Germany	Petroflex Lucidofuscus, W.
22. UMBER ROCK JASPER.							
Whole rocks	tender	heavy	wavy	DEEP BROWN	glassy	Sweden	Petroflex Obscurofuscus, W.



Petroflex  
Venosus.  
W.

Petroflex  
Arenaceus.  
W.

Petroflex Semipellucidus.  
Albus.  
W.

Petroflex Semipellucidus  
Rubescens.  
W.

23. VEIN'D ROCK JASPER.	heavy	rugged	GREENISH	brown veins	Germany
24. SAND JASPER.	very heavy	rough	RUDDY BROWN	white and yellow dots	Italy
4. A G A T E J A S P E R S.					
25. PEARLY AGATE JASPER.	very heavy	rugged	WHITISH	white lines	Germany
26. RED AGATE JASPER.	heavy	uneven	PALE REDDISH	dufky spots	Germany

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
27. VEIN'D AGATE	JASPER.						Petrofalex Semipellucidus Venosus. W.
Great masses	very hard	heavy	smooth	BROWNISH	white and red veins	Bohemia	
28. PEACOCK AGATE	JASPER.						Petrofalex Semipellucidus Variegatus. W.
Great blocks	less hard	very heavy	bubbled	RUDDY	black and yellow veins	Germany	

# COMPOUND FOSSILS.

## ORDER X.

### PREBELLES.

Rounded. hard masses. covered with a crust. and formed of circular coats. round a central nucleus.



FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. RED AND WHITE PEBBLE.							
Oval	hard	heavy	rugged	NUCLEUS YELLOW	crusts red and white	Hampstead- heath	Calculus Albo- Rubens. H.
2. BLACK AND WHITE PEBBLE.							
Round	hard	heavy	uneven	NUCLEUS TAWNY	crusts black, white, yellow	Kenfington	Calculus Nigro Albus. H.
3. BROWN AND WHITE PEBBLE.							
Oblong	hard	heavy	reticu- lated	LARGE BROWN NUCLEUS	crusts white and brown	Hertford- shire	Calculus Fulco Albus. H.
4. BLUE AND RED PEBBLE.							
Round	hard	heavy	smooth	LARGE GREY NUCLEUS	red, blue, and brown crusts	Windfor	Calculus Cæruleo Rubens. H.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
5. WHITE COATED PEBBLE. Uneven masses	hard	heavy	rudded	RED, WHITE, AND BROWN	a thick white cruft	Hampstead	Calculus Corticofus. H.
6. BLUSH AND WHITE PEBBLE. Round	hard	heavy	wrinkled	NUCLEUS BLUEISH	thin crufts of two reds, white and yellow	Hertford- shire	Calculus Rofaceus. H.
7. PURPLE PEBBLE. Oval	hard	heavy	fmooth	NUCLEUS FLESH- COLOUR'D	crufts purple and yellow	Hampstead	Calculus Purpurafcens. H.
8. MAGPYE PEBBLE. Oval	hard	heavy	wrinkled	NUCLEUS BLACK	crufts black and white	Leicefter- shire	Calculus Maculatus. H.



9. GREEN AND WHITE PEBBLE.	Round	hard	heavy	uneven	NUCLEUS GREY	crusts white and green	Northamp- tonshire	Calculus Albo Virens. H.
10. RAINBOW PEBBLE.	Round	hard	heavy	smooth	NUCLEUS SMALL AND RUDDY	thin crusts of all colours	Leicester- shire	Calculus Vericolor. H.
11. ÆGYPTIAN PEBBLE.*	Oblong	hard	heavy	wrinkled	NUCLEUS BROWNISH WHITE	crusts tawny, brown, and black	Ægypt	Calculus Ægyptiacus. H.
12. BROWN AND YELLOW PEBBLE.	Oval	hard	heavy	smooth	NUCLEUS GREEN	crusts brown and yellow	Hampstead	Calculus Fuscoflavus. H.

\* The Ægyptian Pebble is eminent for its Mecca-like variegations; and for the more than ordinary oddities of its veins and spots. Few Fossils require more care in the distinction than the English Pebbles. I once thought them more numerous; but these seem, on strict enquiry, all the true kinds.

# COMPOUND FOSFILLS.

## ORDER XI.

### FLINTS.

Opake, glossy, solid, and of one colour and substance.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
<b>I. CHALK FLINT.</b>							
Uneven maffes	very hard	heavy	rough, white coated	DUSKY	horn-like	chalk-pits	Silex Cretacus. L. gun flints, and glafs.
<b>2. OIL FLINT.</b>							
Great lumps	hard	heavy	naked, and smooth	OLIVE-COLOUR'D	oily	France	Silex Pyromachus. L. gun flints.
<b>3. GREY FLINT.</b>							
Vaft lumps	very hard	heavy	smooth, brown coated	GREY	gloffy	Sweden	Silex Marmoreus. L. gun flints.



# COMPOUND FOS SILS.

## C L A S S II.

### S T O N E S.

Formed into whole strata; composed of two, or more of the native earthy Fossils.

## O R D E R I.

### E A R T H Y S T O N E S.

Composed of hardened Earths, with Saline, or other mixtures.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. OIL STONE.							
Thick plates	soft	heavy	smooth	BLACK	fine	Germany	* Schistus Novacula. L. for whetstones.
2. SLATE STONE.							
Thin plates	hard	heavy	scaly	RAVEN GREY	easily mark'd	Germany	Schistus Tabularis. L. slates for writing.
3. BRITTLE SLATE.							
Thick plates	tender	light	duffy	BLACK	crumbly	Sweden	Schistus Atratus. L.
4. GREEN SLATE.							
Coarse plates	soft	heavy	rugged	GREYISH GREEN	brittle	Germany	Schistus Viridis. L.



5. BLUE SLATE. Fine plates	hard	heavy	even	BLUE GREY	firm	England	for slating houfes.	Schifus Ardefia. L.
6. PURPLE SLATE. Thick plates	hard	light	scaly	PURPLE	brittle	England	for houfes.	Schifus Purpurafcens. H.
7. SOUNDING SLATE. Fine plates	very hard	heavy	smooth	BLACK	found when struck	England	for houfes.	Schifus Solidus. L.
8. CLAY SLATE. Thick strata	foft	light	rugged	YELLOWISH GREY	crumbly	Sweden		Schifus Argillaceus. L.

\* Excellent Linnæus ! fo diftinct and perfect in thefe Stones, little remains for others, but to copy him.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
9. WHITE MARLE SLATE. Vaft strata	very foft	light	fcaly	PURE WHITE	Shattery	England	Schiftus Albus. H. manure.
10. GREY MARLE SLATE. Thick beds	foft	heavy	uneven	DEAD GREY	crumbly	England	Schiftus Margaceus. α L. manure.
11. GREEN MARLE SLATE. Deep strata	hard	heavy	rugged	GREENISH	breaks in the air	England	Schiftus Margaceus. β L. manure.
12. RUDDY MARLE SLATE. Thick strata	very hard	heavy	fcaly	REDDISH	breaks in the air	England	Schiftus Margaceus. γ L. manure.



13. STAINING SLATE.	Coarse beds	soft	light	flaky	DEEP BLACK	stains the hands	Sweden	a coarse paint.	Schistus Nigrica.
14. RAVEN SLATE. ALUM SLATE.	Thick strata	hard	heavy	scaly	RAVEN GREY	firm	England	alum ore.	Schistus Communis. L.
15. DOTTED SLATE.	Thick strata	hard	heavy	rugged	RUDDY	brown spots	Sweden	whetstones.	Schistus Olearius. L.
16. LIMESTONE SLATE.	Vast strata	hard	heavy	scaly	PALE BROWN	gritty	Sweden	lime.	Schistus Effervesens. L.
17. FLINTY SLATE.	Thick plates	very hard	very heavy	flaky	DARK GREY	compact	China		Schistus Compactissimus. L.

\* This often is rich in Alum; in which case it breaks into a kind of rhomboidal fragments, with sparkling surface.

# COMPOUND FOSSILS

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## ORDER II.

### CRYSTALLINE STONES.

Composed of a crystalline matter; debased by earthy and other mixtures.

**T**HE distinction of these Stones is easy, and absolute: they are hard; they are glossy, when broken; they strike fire with steel; they are not affected by Acids; and they run to glass.

Where we see cracks, or hollows, in them, they are usually lined, or filled with shoots of pure Crystal and of Crystal only. Spar has no place but in Sparry Stones.



FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. GRINDSTONE.							
Thick strata	hard	heavy	rugged	WHITISH	fandy	Germany	<sup>Cos</sup> Cotaria. L. for grindstones.
2. CRACKSTONE.							
Vaft strata	foft	heavy	crack'd	GREYISH	fpangled	Sweden	<sup>Cos</sup> Quadrum. L.
3. LIVERSTONE.							
Vaft maffes	tender	heavy	rugged	REDDISH BROWN	bounces in the fire	Sweden	<sup>Cos</sup> Calcareo. L.
4. TYGERSTONE.							
Great maffes	hard	heavy	uneven	RUDDY BROWN	white spots	Sweden	<sup>Cos</sup> Tigina. L.

Q  
09  
2

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
5. IRON STONE.							
Rude lumps	soft	lighter	bubbly	PALE BROWN	round rusty spots	Germany	an iron ore. <small>Cos Variolosa. L.</small>
6. HONEYSTONE.							
Flat lumps	soft	heavy	smooth	PALE YELLOWISH BROWN	smooth	Arabia	for barbers hones. <small>Cos Novacula. L.</small>
7. WHITE SLATE STONE.							
Flat flakes	hard	heavy	rugged	WHITISH	fandy	England	for building. <small>Cos Fimilis. L.</small>
8. RED SLATE STONE.							
Thick plates	tender	very heavy	scaly	REDDISH	gritty, sparkling	England	for building. <small>Cos Fimilis Rufescens. L.</small>



9. CRUMELY STONE.

Thick strata | soft | heavy

*Cos Friabilis.*  
L.

building.

England

10. LOOSE STONE.

Great lumps | brittle | heavy

*Cos Coagmentata.*  
L.

glafs.

Italy

11. FILTERING STONE.

Thick lumps | tender | light

*Cos Filtrum.*  
L.

for filtering water.

Canaries

12. SMOOTH STONE.

Thick strata | very hard | heavy

*Cos Compacta.*

grinding stones.

Germany,  
Sweden

hardens in  
the air

of small,  
clear  
granules

lets water  
pass thro'

granite  
dots

PALE

BRIGHT

PALE  
BROWN

YELLOWISH  
BROWN

rugged

gritty

cavernous

smooth

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
13. BRIGHT STONE.							
Vast strata	hard	heavy	regularly granulated	PALE BROWN	bright	England, Sweden	building. <small>Cos. Strataria. L.</small>
14. YELLOW SANDSTONE.							
Great strata	tender	heavy	fandy	YELLOW	even structure	Yorkshire	<small>Cos. Colorata. L.</small>
15. GREEN SANDSTONE.							
Vast masses	soft	very heavy	rugged	DULL GREEN	granulated	Germany	refuse. <small>Cos. Colorata. β L.</small>
16. BLACK SANDSTONE.							
Great lumps	tender	heavy	uneven	BLACKISH	coarse	Sweden	refuse. <small>Cos. Colorata. γ L.</small>



17. PORCELANE STONE.

Cos  
Porcellana.  
L.

Thick strata

hard

heavy

irregular

GREY

part  
glossy

Sweden

18. MILL STONE.

Cos  
Molaris.  
L.

Vast strata

hard

heavy

irregular

PALE  
BROWN

mixture of  
various  
particles

England

for grinding corn.

19. ROUGH STONE.

Cos  
Fundamentalis.  
L.

Vast strata

very hard

heavy

granulated

RUDDY

sharp  
particles

Sweden

building.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
20. WHITE STONE.							Cos Fundamentalis Alba. L.
Vast strata	hard	heavy	rough	WHITISH	sharp particles	England	building.
21. PLATE STONE.							Quartzum Fissile. L.
Great lumps	very hard	heavy	smooth	PALE GREY	flinty, but gra- nulated	Germany	glass.
22. SLAG STONE.							Quartzum Cotaceum. L.
Vast blocks	hard	very heavy	rugged	PALE BROWN	mixture of great and small grains	Sweden	glass.



# COMPOUND FOSSILS.

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## ORDER III.

### SPARRY STONES.

Composed of Spar ; debased by earthy, and other mixtures.

**T**HESSE are soft, tender, and brittle ; they break irregularly ; they will not strike fire with steel ; and they ferment with Acids. The pure Spar in their construction, dissolves in these liquors ; and sometimes part of the debasing mixture, when Alkaline : the rest remains, and shews the mixt nature of the Stones.

'Tis from these residuums of the various Sparry Stones, washed clean, and examined by the microscope, we may, with truth and certainty, discover their nature and composition.

The cracks in these rocks always afford Spar, never Crystal ; therefore these crystalizations are of matter which was originally a part of the Stone itself, not brought from elsewhere.

The coarser Sparry Stones have been called, Limestone ; and the finer Marbles. The distinctive names shall be preserved here, tho' the distinction itself is vague. I have had some of our Limestones polished, as Marble, which all have call'd, and allowed to be Marble ; and many Marbles always called so, and acknowledged such, are burnt into lime ; especially the fragments, and the upper parts of the strata.

In all Limestones, Marbles, and even in Chalk, the upper part is softer, and coarser ; that which lies deeper, is harder, and finer.

# COMPOUND FOS SILS.

## I. LIMESTONES.\*

Sparry Stones of a dull aspect.

### I. OF A SMOOTH EVEN STRUCTURE.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. WHITE SMOOTH LIMESTONE. Great strata	tender	heavy	uneven	WHITISH	burns easily to lime	England	lime. manure.
2. YELLOW SMOOTH LIMESTONE. Vast masses	hard	heavy	smooth	PALE YELLOW	burns slowly	Venice	lime.

Lapis Calcareus  
Æquabilis Albus.  
W.

Calcareus Æ.  
Flavus  
Cronstedt.



Calcareus Æ.  
Rubens.  
W.

Calcareus  
Ferrugineus  
Cronstedt.

Calcareus  
Griseus  
Cronstedt.

Calcareus Æ.  
Viridis.  
W.

3. RUDDY SMOOTH LIMESTONE.	Thick strata	tender	light	rough	REDDISH BROWN	brittle	Sweden	lime.
4. RUSTY SMOOTH LIMESTONE.	Thin strata	hard	heavy	flaky	RUST COLOUR'D	glossy	Germany	lime.
5. GREY SMOOTH LIMESTONE.	Vast masses	hard	light	rugged	BLUEISH GREY	firm	England	lime. manure.
6. GREEN SMOOTH LIMESTONE.	Thick strata	very hard	heavy	irregular	GREENISH	burns quick	Prague	lime.

\* Here Cronstedt takes the lead, as Linnaeus did in the preceding Order of the Crystalline Stones; the great Swede, not allowing the mineralists distinction, as of Species, but accounting them Varieties. 'Tis thus the Student in this abstruse science should act, always selecting the names of that author, who has been most distinctive; and adding, and reforming from his own store.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
7. IRON SMOOTH LIMESTONE.							
Large strata	very hard	very heavy	undulated	GLOSSY, IRON GREY	burns slowly	Germany	lime. Calcareus Æ. Fereus. W.
8. BROWN SMOOTH LIMESTONE.							
Great lumps	hard	heavy	rugged	DEEP BROWN	burns difficultly	Dalecarlia	lime. Calcareus Æ. Fuscus. W.
9. BLACK SMOOTH LIMESTONE.							
Vast strata	soft	light	smooth	BLACKISH	burns easily	Germany	lime. Calcareus Niger Cronstedt.
10. MARBLED SMOOTH LIMESTONE.							
Thick strata	very hard	heavy	flaky	grey, ruddy, and other colours, mixed	bright	Germany	lime. Calcareus Æ. Venofus. W.



2. GRITTY LIMESTONES.

11. COARSE WHITE GRITTY LIMESTONE.										
Vast strata	tender	light	granulated	DEAD WHITE	large grains	England	lime manure.	Calcareus Granulatus Alb. 1. Cronstedt.		
12. FINE WHITE GRITTY LIMESTONE.										
Great lumps	hard	heavy	rough	BRIGHT WHITE	small grains	Sweden	lime.	Calcareus Granulatus Alb. 2. Cronstedt.		
13. BRIGHT GRITTY LIMESTONE.										
Irregular strata	brittle	light	dufty	SHINING WHITE	fulphureous smell	Italy	for brimstone.	Calcareus Scintillans Cronstedt.		
14. RED GRITTY LIMESTONE.										
Thick strata	hard	heavy	rugged	REDDISH	crackly	England	lime.	Calcareus Granulatus Ruber Cronstedt.		

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
15. GREEN GRITTY LIMESTONE.							Calcareus Granulatus Virefcens. W.
Thin strata	tender	light	irregular	DARK GREEN	burns easily	Germany	lime.
16. BLACK AND WHITE GRITTY LIMESTONE.							Calcareus Granulatus Nigro Albescens Cronstedt.
Thick beds	hard	heavy	undulated	MARBLED, OF BLACK, WHITE, AND BROWN	burns flowly	Salberg	lime.
17. GREEN AND WHITE GRITTY LIMESTONE.							Calcareus Granulatus Albo Viridis Cronstedt.
Rude lumps	tender	heavy	rugged	WHITE, AND GREEN	blotch'd	Salberg	lime.
18. WHITE FLAKY LIMESTONE.							Calcareus Squammosus Albus Cronstedt.
Vast masses	hard	light	rugged	SNOW WHITE	thick plates	Sweden	lime.

3. FLAKY LIMESTONES.



19. GREY FLAKY LIMESTONE.	Thin strata	tender	heavy	smooth	DUSKY GREY	coarse scales	Germany	Calcareus Squammosus Griseus Cronstedt.	lime.
20. SILVERY FLAKY LIMESTONE.	Small lumps	very hard	heavy	polished	PURE WHITE	close, small scales	Sweden	Calcareus Albus Dalarnensis Cronstedt.	lime.
21. RED FLAKY LIMESTONE.	Great strata	tender	very heavy	uneven	RUDDY	large scales	Germany	Calcareus Ruber Cronstedt.	lime.
22. CLOUDED FLAKY LIMESTONE.	Thick strata	hard	heavy	rugged	GREY, RED, AND WHITE	small scales	Sweden	Calcareus Variegatus Cronstedt.	lime.

If there can be a distinction between Limestone, and Marble, this twenty-second kind is the connecting link: 'tis either the coarsest of the Marbles, or the finest of the Limestones.

# COMPOUND FOS SILS.

## 2. M A R B L E S.

Sparry Stones, bright, and glittering.

### I. O F O N E C O L O U R.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	C O L O U R.	QUALITIES.	P L A C E.	U S E S.
I. P A R I A N M A R B L E.							Marmor Nobile Album. L.
Vaft blocks	tender	heavy	wrinkled	PURE WHITE	glittering	Paros	for ftatues.
2. C A R R A R A M A R B L E.							Marmor Lunense. H.
Great mafles	hard	heavy	fmooth	GOOD WHITE	clear	Italy	ftatues.



3. GREY MARBLE.

Thick strata very hard

heavy

irregular

DUSKY  
GREY

smells like  
horn,  
when  
burnt

Hildesheim

ornaments.

Marmor  
Palumbinum.  
W.

4. YELLOW MARBLE.

Vast strata very hard

heavy

rugged

PALE  
YELLOW

sparkling

Italy

ornaments.

Marmor  
Terebinthinatum.  
Cesalp.

5. RED MARBLE.

Great blocks hard

heavy

irregular

DULL RED

opaque

Italy

ornament.

Marmor  
Rufum.  
L.

6. BLUE MARBLE.

Thick beds very hard

very  
heavy

wrinkled

DUSKY  
BLUE

high  
polish

Spain

monuments.

Marmor  
Numidium.  
H.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
7. GREEN MARBLE.							
Broken strata	tender	light	smooth	GREEN	cloudy	England	Marmor Lacedemonium. H. ornaments.
8. SPARKLING BLACK MARBLE.							
Vast strata	very hard	heavy	granulated	BRIGHT BLACK	glittering	Italy	Marmor Luculleum. H. for tombs.
9. DULL BLACK MARBLE.							
Great blocks	tender	very heavy	smooth	DEAD BLACK	a touch- stone	Italy	Marmor Chium. H. monuments.
10. BROWN MARBLE.							
Thick strata	soft	light	irregular	UMBER- COLOUR	dull	Italy	Marmor Lividium. W. ornaments.



2. SHELLY MARBLE S.

Marmor Venosum Album Agris.			grey veins, and small shells	Italy	chimney-pieces.
Marmor Derbiense. H.		Derbyshire	fossil, en- trochi, and shells	Derbyshire	chimnies.
Marmor Virscens. H.		Bohemia	shells with white spar	Bohemia	ornaments.
Marmor Cinereovirens. H.		Suffex	black and white shells	Suffex	ornaments.

11. GREY SHELLY MARBLE.

Vast strata  
tender  
heavy

12. GREY ENTROCHINE MARBLE.

Immense  
blocks  
hard  
heavy

13. GREEN SHELLY MARBLE.

Great beds  
tender  
very  
heavy

14. GREY GREEN SHELLY MARBLE.

Deep strata  
tender  
light

FOR M.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
<b>15. BLACK SHELLY MARBLE.</b>							
Great blocks	hard	heavy	rumpled	DEEP BLACK	white shells	Ireland	Marmor Nigerrimum, H. tombs.
<b>16. BLACK CORALLOIDE MARBLE.</b>							
Thick strata	hard	very heavy	uneven	GREYISH BLACK	feathery coralloides	Derbyshire	Marmor Coralliticum, H. ornaments.
<b>3. V A R I E G A T E D M A R B L E S.</b>							
<b>17. WHITE AND GREY MARBLE.</b>							
Vast strata	tender	heavy	irregular	GOOD WHITE	blueish grey veins	Italy	Marmor Albocæruleum, H. ornaments.
<b>18. PURPLE AND WHITE MARBLE.</b>							
Deep strata	hard	very heavy	cracked	WHITE, AND PURPLE	blotch'd	Italy	Marmor Albopurpureum, H. ornaments.



19. BROWN AND WHITE MARBLE.

Thick strata

soft

light

smooth

BROWN,  
AND  
WHITE

blotches.  
scratch'd  
by a pin

Italy

Marmor  
Albofuscum.  
H.

ornaments.

20. RED AND WHITE MARBLE.

Vast strata

very hard

very  
heavy

irregular

PALE RED,  
AND WHITE

veined

Italy

Marmor  
Alborubescens.  
H.

chimney-pieces.

21. BLUE AND WHITE MARBLE.

Great strata

soft

light

rugged

BLUEISH,  
AND WHITE

in  
blotches

Italy

Marmor  
Alboceruleum.  
H.

ornaments.

22. BROWN RED AND WHITE MARBLE.

Great blocks

hard

heavy

irregular

THREE-  
COLOUR'D

veins and  
blotches

Italy

Marmor  
Pallidfuscum. V.  
H.

ornament.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
23. BROWN BLACK AND WHITE MARBLE. Great strata	tender	heavy	crack'd	THREE-COLOUR'D	veins and blotches	Italy	Marmor Fuscum Nigrovariegatum. H. ornaments.
24. BROWN AND WHITE MARBLE. Great blocks	very hard	very heavy	smooth	BROWN	white blotches	Italy	Marmor Fusco-albidum, H. ornaments.
25. SYENNA MARBLE. Vast blocks	tender	heavy	shattery	YELLOW, WITH	purple spots and blotches	Italy	Marmor Flavopurpureum. H. ornaments.
26. AFRICAN MARBLE. Great strata	hard	very heavy	irregular	YELLOW, WITH	deep blue spots	Africa, and Spain	Marmor Flavocæruleum. H. chimney-pieces.



Marmor  
Portafancta.  
W.

ornaments.

Marmor Nigro-  
album.  
H.

tombs.

Marmor Nigro-  
luteum.  
H.

ornaments.

Marmor Nigro-  
rubens.  
H.

chimney-pieces.

Spain

Italy

Italy

Ireland

red and  
white  
veins

narrow  
white  
veins

yellow  
veins

red and  
white  
veins

DEEP  
YELLOW,  
WITH

BLACK,  
WITH

FINE  
BLACK

GOOD  
BLACK

undulated

rugged

irregular

smooth

27. BROCCATELLO MARBLE.

very  
heavy

tender

Thin strata

28. BLACK AND WHITE MARBLE.

heavy

very hard

Vast strata

29. BLACK AND GOLD MARBLE.

very  
heavy

hard

Thick strata

30. BLACK AND RED MARBLE.

heavy

hard

Great blocks

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
31. BLACK BROCADE MARBLE.							Marmor Nigrum Variegatum. H.
Thick strata	tender	heavy	rugged	FINE BLACK	red, white, and yellow veins	Derbyshire	ornaments.
32. AUGUSTAN MARBLE.							Marmor Viride Albens. H.
Thick masses	firm	very heavy	rugged	LIGHT GREEN	white veins and talc	Ægypt	ornaments.
33. BLACK SERPENTINE MARBLE.							Marmor Ophites Niger. H.
Great lumps	hard	heavy	irregular	DEEP GREEN	black and white spots	Africa	ornaments.
34. WHITE SERPENTINE MARBLE.							Marmor Ophites Album. H.
Great lumps	soft	light	rugged	LIGHT GREEN	white, and some black spots	Ægypt	ornaments.



35. GREY AND BLACK MARBLE.

Large masses | very hard | heavy

36. ARABIAN MARBLE.

Great lumps | hard | heavy

37. GREEN VEIN'D MARBLE.

Large masses | hard | very heavy

38. RED AND GOLD MARBLE.

Great strata | hard | heavy

ASHY  
GREY

Africa

black  
spots

Marmor Ophites  
Cinereus.  
H.

ornaments.

BROWNISH  
GREY

Arabia

oblong,  
green  
spots

Marmor Fufco-  
virens.  
H.

ornaments.

LIGHT  
GREY

Germany,  
Cornwall

green  
veins, and  
spots

Marmor Cinereo-  
virens.  
H.

ornaments.

GOOD  
RED

Italy

gold and  
white  
veins

Marmor  
Thebaicum.  
H.

ornaments.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
39. ONYX MARBLE.							Marmor Polyzonias. W.
Small masses	hard	light	in broken beds	BROWN	blue, black, in white, in beds	Germany	snuff-boxes.
40. FLORENTINE MARBLE.							Marmor Florentinum. L.
Great masses	tender	heavy	rugged	YELLOWISH BROWN	rude figures in black	Italy, Arabia	ornaments.
41. DENDRITE MARBLE.							Marmor Hafiacum. W.
Great lumps	hard	heavy	rough	PALE BROWN	mocoa figures in black	Hesse	ornaments.
42. SLATE MARBLE.	4.						Marmor Fiffile. L.
Thick strata	tender	heavy	plated	WHITISH YELLOW	fiffile	Germany	ornaments.

D E B A S E D M A R B L E S.



Marmor  
Schistofum.  
L.

for lime.

Sweden

shattery

BLACK

plated

heavy

43. LIME MARBLE.

soft

Thick strata

Marmor  
Tardum.  
L.

ornaments.

Sweden

almost  
transpa-  
rent

PURE  
WHITE

granulated

heavy

44. CRYSTALLINE MARBLE.

very hard

Great lumps

Marmor  
Acetofum.  
L.

ornaments.

Lapland

bright  
and chaf-  
fy, when  
broke

SNOW  
WHITE

streaky

heavy

45. CHAFFY MARBLE.

tender

Great lumps

Marmor  
Stratarium.  
L.

ornaments.

Sweden

full of  
shells and  
ætitæ

RUDDY

crack'd

heavy

46. CLAY MARBLE.

soft

Vast strata

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
47. SANDY MARBLE. Great strata	soft	heavy	irregular	BROWNISH WHITE	full of sand and clay	France	building.  Marmor Sectilis L.

S T O N E S.

O R D E R IV.

C O N C R E T E S.

Composed of various matters, rudely mixt together.



## I. P O R P H Y R Y S.

Composed of Jasper, Crystal, and Shirl.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. PURPLE AND WHITE PORPHYRY. Vast rocks	very hard	very heavy	rugged	DEEP PURPLE	small white specks	Ægypt	Saxum Porphyrius γ. L. ornaments.
2. BROWN RED AND WHITE PORPHYRY. Great rocks	very hard	heavy	granulated	DEEP BROWN	purple and white spots	Sweden	Saxum Porphyrius, L. ornaments.
3. BLACK AND RED PORPHYRY. Thick strata	very hard	heavy	irregular	BLACKISH	spots of deep red	Arabia	Saxum Porphyrius α. L. ornaments.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
4. BLACK RED AND WHITE PORPHYRY.							<sup>Saxum</sup> Porphyrius β. L.
Vast blocks	very hard	heavy	ragged	DEEP BLACK	spots of red and white	Ægypt	ornament.
5. GREY AND BLACK PORPHYRY.							<sup>Saxum</sup> Porphyrius α. L.
Great masses	very hard	heavy	uneven	RAVEN GREY	spots of deep black	Syria	ornaments.
6. GREEN AND WHITE PORPHYRY.							<sup>Saxum</sup> Porphyrius δ. L.
Vast rocks	very hard	heavy	rugged	PALE GREEN	white spots	Germany	ornaments.
7. MINORCAN PORPHYRY.							<sup>Porphyrius</sup> Miniaceus. H.
Great masses	most hard	very heavy	granulated	BRIGHT RED	green, white, and black spots	island of Minorca	worthy the first uses.



8. ROSE PORPHYRY.	Vast blocks very hard heavy	most rugged	ROSE COLOUR	black, green, white spots	upper Ægypt	Porphyrius Carneus. H.	for ornaments.
9. GREY AND WHITE PORPHYRY.	Rounded lumps hard heavy	very smooth	DARK GREY	white spots	Sweden	Porphyrius Griseus Cronstedt.	for ornaments.
2. GRANITE S.							
Composed of Jasper, Crystal, and Talc.							
1. RED AND BLACK GRANITE.	Immenſe rocks very hard heavy	rugged	FINE RED	black spots	Ægypt	Granita Rubra. H.	ornaments.
2. BLACK RED AND WHITE GRANITE.	Vast rocks most hard heavy	irregular	MIXT BLACK AND RED	white spots	Arabia	Granites Pyropæcilos. H.	obelisks.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
3. GREEN RED AND WHITE GRANITE.							Saxum Granites Chinense L.
Great masses	hard	heavy	rugged	GREEN AND RED	white spots	China	ornaments.
4. MOORSTONE GRANITE.							Granita Albo- nigra. H.
Great lumps	very hard	heavy	most rugged	WHITE	black spots	Cornwall	curbs and steps in building.
5. GOLDEN GRANITE.							Granites Luteoniger. H.
Great lumps	hard	heavy	rugged	FLESH COLOUR'D	white, black, and gold spots	Minorca	fit for the best uses.
6. LOOSE GRANITE.							Granites Friabilis Cronstedt.
Crumbly masses	harsh	heavy	irregular	RUDDY	white and black spots	Sweden	for melting furnaces



### 3. T R A P E S T O N E S.

Composed of Jasper, Clay, and Slate; with some Iron.

1. GREY CHAFFY TRAPESTONE.	flat	RAVEN GREY	spotted whitish	Sweden	Trapiskiol Grisea Cronstedt. glass bottles.
2. BLACKISH CHAFFY TRAPESTONE.	bed upon bed	BLACK	blacker spots	Delarne	Trapiskiol Nigra Cronstedt.
3. ASHY SAND TRAPESTONE.	granulated	ASH COLOUR'D	dark spots	Sweden	Trapiskiol Cinerea Cronstedt. bottles.
4. BROWN TRAPESTONE.	gritty	DEEP BROWN	whitish specks	Sweden	Trapiskiol Fusca Cronstedt. bottles.

1. Flat cakes

hard

heavy

2. Vaft rocks

hard

very  
heavy

3. Thick strata

brittle

heavy

4. Whole rocks

hard

heavy

F O R M,	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	P L A C E.	U S E S.
5. RUDDY TRAPESTONE. Serpentine veins	very hard	very heavy	coarse, and rough	RUDDY	brown spots	Norway	Trapiskiol Rufa Cronstedt. coarse glafs.
6. WHITISH TRAPESTONE. Vaft strata	tender	heavy	smooth	WHITISH	white specks	faintly striated	Trapiskiol Sorberkenfis Cronstedt glafs.
7. BLUE TRAPESTONE. Rocks	hard	very heavy	even	DEAD BLUEISH	unspotted	uniform	Trapiskiol Carulefcens Cronstedt. good glafs.
8. BLACK FINE TRAPESTONE. Veins in rocks	hard	heavy	smooth	DEEP BLACK	unspotted	close	Trapiskiol Nigra Cronstedt. touchstone.

The Trapestones have all a tendency to split like Slate; and to break into a kind of large dice, when shattered by a perpendicular blow: they do not always form whole rocks; but make thick veins in their uneven cracks. They are usually found with various mixtures, and all contain some iron.



# S T O N E S.

## O R D E R V. Q U A R R Y S T O N E S.

F O R M.	H A R D N E S S.	W E I G H T.	S U R F A C E.	C O L O U R.	Q U A L I T I E S.	P L A C E.	U S E S.
I. LAPLAND QUARRY STONE.							
Rocks	hard	heavy	raised in small lumps	REDDISH	white spots.	Lapland	Saxum Laponicum, L. *
28. DANNEMORE QUARRY STONE.							
Thick strata	very hard	heavy	irregular	BLUEISH	transpa- rent, in thin pieces	Dannemore	Saxum Dannemorenic. L. a poor iron ore.

\* In regard to these Stones, no author is so excellent as Linnaeus: himself has examined them in Sweden; and all his distinctions may be depended on. 'T were well if the Stones of other countries had been so observ'd; but these run thro' all the north.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
3. SAHLBERG QUARRY STONE.							
Rocks	tender	heavy	uneven	GREY	coarse granulated	Sahlberg	lime. Saxum Sahlbergense, L.
4. ITALIAN QUARRY STONE.							
Thick strata	soft	heavy	plated	PALE BROWN	scaly, with talc	Italy	in buildings. Saxum Talcifum, L.
5. CAPE QUARRY STONE.							
Great masses	tender	light	granulated	GREY	small black spots	island of St. Helena	lime. Saxum Helense, L.
6. MOUNTAIN QUARRY STONE.							
Thick strata	very hard	heavy	wav'd	PALE BLUEISH GREY	small white spots	tops of Lap- land moun- tains	glass. Saxum Æthereum, L.



7. WAVY QUARRY STONE.

Rocks | hard | heavy

8. RADIANT QUARRY STONE.

A vast rock | hard | heavy

9. FAHLUN QUARRY STONE.

Vast strata | tender | heavy

10. PEARLY QUARRY STONE.

Thick strata | hard | heavy

RUDDY  
BROWN

undulated

spangled  
with talc

Sweden

Saxum  
Undulatum.  
L.

building.

PALE  
BROWN

rugged

rays of  
black and  
purple  
garnets

Germany

Saxum  
Radians.

building.

RUDDY  
BROWN

granulated

white  
specks

Fahlun

Saxum  
Fahlunense.  
L.

building.

WHITISH

coarsely  
granulated

white  
specks

Nericia

Saxum  
Margaritaceum,  
L.

building.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
11. WHETTING QUARRY STONE.							
Thin strata	tender	heavy	streaky	REDDISH WHITE	striated	Scania	whetstones. Saxum Novaculare, L.
12. STENSHUWHEED QUARRY STONE.							
Thick strata	soft	light	scaly	YELLOWISH BROWN	flaky	Sweden	whetstones. Saxum Stenonis, L.
13. MORANE QUARRY STONE.							
Thick strata	hard	light	rugged	REDDISH BROWN	transpa- rentspecks	Sweden	building. Saxum Morene, L.
14. BLACK LIN'D QUARRY STONE.							
Great rocks	very hard	heavy	uneven	RUST COLOUR'D	black streaks	Sweden	buildings. Saxum Decussatum, L.



17. CORNSTONE.

Thick strata tender

light

wav'd

PALE  
BROWN

oblong  
specks

Germany

Saxum  
Frumentale.  
L.

buildings.

16. MIXT QUARRYSTONE.

Vast strata hard

heavy

rugged

WHITISH

black, fil-  
very, and  
red spots

Sweden

Saxum  
Molare.  
L.

for mill stones.

17. GARPENBERGSTONE.

Great strata hard

heavy

granulated

WHITISH

with small  
white talc

Garpenberg

Saxum  
Garborge.  
L.

buildings.

18. BLUE GREEN QUARRYSTONE.

Thick strata tender

light

flaky

BLUEISH  
GREEN

greenest  
wet

Smoland

Saxum  
Cerulefens.  
L.

furnaces.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
19. SALT QUARRY STONE.							
Great rocks	tender	heavy	flaky	BROWN	spangled, crumbles in air	Sweden	for nitre. Saxum Fatiscens. L.
20. ALPINE QUARRY STONE.							
Thick strata	shattery	heavy	irregular	PALE BROWN	with talc and granites	Norway	buildings. Saxum Alpinum. L.
21. GRANITE QUARRY STONE.							
Vast rocks	hard	heavy	rugged	BLACK	with brown granites and talc	Sweden	buildings. Saxum Granatum. L.
22. ROSE QUARRY STONE.							
Thick strata	very hard	heavy	raised in lumps	PALE RED	white and talcy spots	Sweden	mill stones. Saxum Tritorium. L.



23. NORWAY QUARRY STONE.	Vaft rocks	hard	heavy	plated	BLACK AND WHITE	fiffle	Norway	building.	Saxum Roeroficenf. L.
24. GOLDEN QUARRY STONE.	Whole mountains	tender	light	irregular	PALE BROWN	spangles of yellow talc	Sweden	buildings.	Saxum Montanum. L.
25. MARESTRA AND QUARRY STONE.	Vaft strata	tender	light	uneven, and plated	WHITISH	fmall white spangles	Sweden	buildings.	Saxum Marestrandenf. L.
26. RUDDY QUARRY STONE.	Thick beds	hard	heavy	plated	REDDISH	red gar-nets and white spangles	Sweden	buildings.	Saxum Punctatum. L.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
27. BITSBERG QUARRY STONE.							
Great rocks	hard	heavy	streaky	BLACK	longish black specks	Sweden	buildings.  Saxum Bitsbergenſe. L.
28. METALLINE QUARRY STONE.							
Thick ſtrata	very hard	heavy	ſmooth	ASH COLOUR'D	white ſpecks and ſpangles	Sweden	mother of ores.  Saxum Metalliferum. L.
29. SIBERIAN QUARRY STONE.							
Great maſſes	very hard	heavy	ſmooth	RED	white ſpots	Siberia	buildings.  Saxum Sibericum.
30. ANGERMAN QUARRY STONE.							
Thin ſtrata	hard	heavy	rugged	WHITISH	full of black talc	Sweden	buildings.  Saxum Angermanenſe. L.



Saxum  
Norbergenſe.  
L.

mother of iron ore.

Saxum  
Fornaceum.  
L.

for furnaces.

Saxum  
Cotrarium.  
L.

for whetſtones.

Saxum  
Grandævum.  
L.

furnaces.

31. NORBERG QUARRY STONE.

Vaſt beds

hard

very  
heavy

irregular

WHITE

white  
ſpots

Norberg

32. FURNACE QUARRY STONE.

Great ſrata

flaty

heavy

plated

GREY

white and  
talcy ſpots

Sweden

33. WHETTING STONE.

Oblong  
maſſes

tender

heavy

flaky

DEEP  
BROWN

like foſſil  
wood

Cologn

34. ANTIENT QUARRY STONE.

Vaſt rocks

hard

heavy

granulated

DARK  
GREY

talcy and  
bright  
ſpots

Sweden

M  
B  
N

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
35. RINGING QUARRY STONE.							Saxum Tinnitans. L.
Great rocks	very hard	heavy	smooth	IRON GREY, WITH SMALL GARNETS	rings, when struck	Sweden	buildings.
36. CLAY QUARRY STONE.							Saxum Primigenum. L.
Thick strata	hard	heavy	smooth	YELLOWISH BROWN	like hard clay	Sweden, England	coarse buildings.
37. PALE QUARRY STONE.							Pfadium Fragile. H.
Great strata	tender	light	rough	WHITISH BROWN	coarse	Northamp- tonshire	buildings.
38. BRIGHT QUARRY STONE.							Pfadium Durius. H.
Thick strata	hard	heavy	uneven	WHITISH	fine	Dorsetshire	buildings.



39. DUSKY QUARRY STONE.

Vast strata

tender

light

irregular

DUSKY  
GREYISH

coarse

Portland

buildings.

*Pfadurium*  
*Albidofuscum.*  
H.

40. ROUND GRITTED QUARRY STONE.

Great masses

tender

light

granulated

PALE  
BROWN

formed of  
crumbly  
stalag-  
mites

Ketton, in  
Rutland

buildings.

*Pfadurium*  
*Rotundatum.*  
H.

41. TAWNY QUARRY STONE.

Thick strata

soft

light

rugged

YELLOWISH  
BROWN

full of  
spangles

Leicester-  
shire

in buildings.

*Pfadurium*  
*Scintillans.*  
L.

42. OLIVE QUARRY STONE.

Vast strata

tender

heavy

plated

GREYISH  
GREEN

filice, and  
spangled

Mendip  
hills

in buildings.

*Ammochifum*  
*Virescens.*  
H.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
43. SPUNGY QUARRY STONE.							Sympexium Porofum. H.
Great rocks	very hard	heavy	uneven	PALE GREY	porous	Yorkshire	in buildings.
44. STRAW COLOUR'D QUARRY STONE.							Sympexium Albido- flavescens. H.
Thick strata	hard	very heavy	irregular	VERY PALE YELLOW	deeper yellow veins	Dorsetshire	in buildings.
45. LEAD COLOUR'D QUARRY STONE.							Sympexium Subcaeruleum. H.
Thick strata	very hard	heavy	smooth	DULL BLUEISH	perfectly even, like flint	Northamp- tonshire	in buildings.



\* Sympexium Rubro-  
virens.  
H.

46. VARIEGATED QUARRY STONES.

Thin strata	tender	heavy	irregular	DUSKY RED	blotches of green	Derbyshire	coarse buildings.
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\* These are the Stones of England, differing from the Swedish: five and twenty-years since, I examined, one by one, the Quarry Stones of this kingdom, in the same manner in which the excellent Linnaeus has lately gone through those of Sweden. I hope those who study Fossils in other countries, will follow the same method; for there is no other: and the subject is worthy all attention.

S T O N E S.

O R D E R VI.

A G G R E G A T E S.

Formed of various Fossil matters, connecting, coating, or concreted with one another.

I. C O N N E C T I N G P U D D I N G S T O N E S.

A pebbly matter cementing together various pebbles.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. PALE PUDDING STONE.							
Great lumps	very hard	heavy	full of lumps	CREAM COLOUR'D	various pebbles	Hertfordshire	Lithozugium Albo-Flavicans. H. for snuff-boxes.
2. GREY PUDDING STONE.							
Large masses	hard	heavy	rude	BRIGHT GREY	large pebbles	Hertfordshire	Lithozugium Albo-griseum. H. snuff-boxes.
3. RED PUDDING STONE.							
Large lumps	hard	heavy	rugged	RED	small pebbles	Lincolnshire	Lithozugium Rubescens. H. ornaments.
4. BROWN PUDDING STONE.							
Great lumps	soft	heavy	irregular	DULL BROWN	filled with various pebbles	Leicestershire	Lithozugium Fuscum. H. boxes.



Lithozugium Impurium  
Rubescens.  
H.  
coarse buildings.

Lithozugium Impurium  
Ceruleum.  
H.  
pavements.

Lithozugium Albo-  
virens.  
H.  
fit for fine works.

Lithozugium Impurium  
Venosum.  
H.  
coarse buildings.

Yorkshire

Leicester-  
shire

Minorca,  
England

Scarborough

red,  
crystalline  
lumps

with  
white  
lumps

with co-  
lourless  
lumps

white  
veins and  
lumps

DULL RED

BLUEISH

GREEN

PALE RED

rude

rugged

rugged

rugged

5. COARSE RED PUDDING STONE.  
Vaft lumps  
foft  
heavy

6. COARSE BLUE PUDDING STONE.  
Vaft mafles  
hard  
heavy

7. COARSE GREENISH PUDDING STONE.  
Rounded  
nodules  
very hard  
heavy

8. COARSE VEINY PUDDING STONE.  
Great lumps  
foft  
heavy

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
9. OCHREOUS PUDDING Great lumps	hard	STONE. very heavy	rude and irregular	YELLOWISH BROWN	full of pebbles and sand	Sweden	Saxum Amnigenum. L. coarse furnaces.
10. SHELLY PUDDING Irregular masses	soft	STONE. heavy	rugged	TAWNY	full of shells, sand, and pebbles	Sweden	Tophus Marinus. L. an iron ore.
Thin beds	soft	STONE. heavy	uneven	YELLOW	full of large sand	Germany	Tophus Arenaceus. L. an iron ore.



# A G G R E G A T E S T O N E S.

## O R D E R II. C O N C R E T E D.

### T O P H E S.

F O R M.	H A R D N E S S.	W E I G H T.	S U R F A C E.	C O L O U R.	Q U A L I T I E S.	P L A C E.	U S E S.
1. B R O W N C L A Y T O P H E.							Tophus Argellæceus Fuscus. H.
Great lumps	hard	heavy	smooth	Y E L L O W I S H B R O W N	clay-like	Effex	useless.
2. R E D D I S H C L A Y T O P H E.							Tophus Argillæceus. L.
Large masses	very hard	heavy	wav'd	R E D D I S H	stone-like	Sweden	useless.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
3. SANDY TOPHE.							Tophus Thermalis. L.
Thin cakes	brittle	heavy	uneven	YELLOWISH	fandy	German Spa	useless.
4. WHITE STONE TOPHE.							Tophstein Alba Cronstedt.
Great lumps	hard	heavy	smooth	WHITISH	clay-like surface	Sweden	
5. GREY STONE TOPHE.							Tophus Ludus. L.
Great lumps	tender	heavy	smooth	GREY	hard on the surface	Sweden	
6. GLOBE TOPHE.							Tophus Globus. L.
Round lumps	hard	heavy	dufty	YELLOW	fandy	clay pits	



Tophus  
Sulphureus.  
L.

Tophus  
Aluminaris.  
L.

Tophus  
Osteocolla.

7. SULPHUR TOPHE.

Thick cakes  
tender

light

duffy

GREY

burns like  
brimstone

mineral  
waters

8. ALUM TOPHE.

Thick lumps  
soft

heavy

irregular

GREYISH  
BROWN

compact

alum works

9. BONE TOPHE.

Hollow  
pieces  
tender

light

uneven

WHITE

bone-like

Germany

a medicine.

# A G G R E G A T E S.

## ORDER III.

### COATING.

#### CRUSTATED BODIES.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. ROOT CRUST.							
Oblong pieces	tender	light	rugged	RUSTY BROWN	hollow	Ireland	Tophus Pertafus. L.
2. WOOD CRUST.							
Oblong pieces	soft	heavy	rough	YELLOWISH	coated as wood	Germany	Tophus Siderxylon. L.



3. HARD NUCLEATE CRUST.	Oval lumps	hard	heavy	rugged	YELLOWISH	ruddy crusts	England	Empheropyra Lævis. H.
4. SOFT NUCLEATE CRUST.	Round lumps	tender	heavy	scaly	BROWNISH	ruddy and greenish crusts	England	Empheropyra Mollior. H.
5. SOUNDING NUCLEATE CRUST.	Round lumps	hard	heavy	dufty	YELLOWISH	rattleslike eagle- stone	England	Heteropyra Durior. H.
6. HARD DUSTY CRUST.	Flatted lumps	hard	heavy	full of cracks	YELLOWISH	ruddy crusts, dufty within	England	Geodes Rimofa H.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
7. SOFT	DUSTY CRUST.						Geodes Rugosa. H.
Oval lumps	soft	heavy	rudded	TAWNY	purple, yellow crusts	England	
8. GREAT	WATER CRUST.						Enhydros Crassior. H.
Large lumps	hard	heavy	crack'd	YELLOWISH	brown crusts, water within	England	
9. SMALL	WATER CRUST.						Enhydros Tenuior. H.
Oval	tender	light	dusty	BROWNISH	ruddy crusts, and water	England	
10. PEA	CRUST.						Tophus Oolithus. L.
Rude lumps	soft	light	of round lumps	BROWNISH	brittle	Germany	



11. CONIC CRUST.	Thick cones tender	light	rugged	YELLOWISH BROWN	ruddy blotches	Helfenbeng	Tophus Turbinatus. L.
12. ONION CRUST.	Round balls tender	heavy	shelly	BLACK	ragged at edges	Afia	Tophus Spatofus. L.
13. PEAR CRUST.	Oblong lumps soft	heavy	tilly	REDDISH YELLOW	brown crusts	Westrogoth- land	Tophus Cotaceus. L.
14. TURN'D CRUST.	Oval lumps very hard	very heavy	scaly	DEEP BLACK	a ball of pyrites in the centre	Yorkshire	Tophus Lenticularis. L.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
15. RAGGED CRUST.							
Vast lumps	tender	heavy	ragged	YELLOWISH	faty	Germany	Tophus Schistofus. L.

A G G R E G A T E S.

OR DER IV.

HELMONTIÆ.

WAXEN VEIN S.

Concreted Clay, and Spar, with cracks filled up by various matters.



I. WITH THE VEINS OF SPAR.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. WHITE WAXEN VEIN. Flatted cakes	hard	heavy	crack'd in small divisions	WHITE ON SURFACE, BROWN WITHIN	lemon-colour'd veins	river fides in Germany	Secomia Cinerea, H. a medicine for the gravel.
2. BLACKISH WAXEN VEIN. Oval cakes	tender	heavy	large divisions	BLACKISH BROWN	white veins	Pancrafs	Secomia Fulco-nigricans, H.
3. CLAY COLOUR'D WAXEN VEIN. Vast cakes	hard	heavy	large divisions	BROWNISH YELLOW	pale yellow veins	London, clay-pits	Secomia Fulco-flavescens, H.
4. BROWN WAXEN VEIN. Vast cakes	very hard	heavy	few divisions	RUSTY BROWN	brown veins	Hertford-shire	Secomia Fulco-ferruginea, H.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
<b>2. W I T H E A R T H Y V E I N S.</b>							
5. CRUSTED WAXEN VEIN. Flatted maffes	hard	heavy	rugged	YELLOWISH	crusted over, a nucleus	Deptford	Secomia Crustata, H.
6. IRON WAXEN VEIN. Flat maffes	hard	heavy	few cracks	REDDISH BROWN	yellow veins	Yorkshire	Secomia Ferruginea, H.
7. COMPACT WAXEN VEIN. Vast rounded cakes	very hard	heavy	numerous cracks	UMBER BROWN	white earthy veins	Leicester-shire	Gaiophragmium Fuscum, H.
8. COATED WAXEN VEIN. Oval lumps	hard	heavy	a thin coat	PALE BROWN	reddish brown veins	Yorkshire	Gaiophragmium Ferrugineum, H.



3. WITH THE VEINS OF MUNDIC.

Pyriticum  
Mollius.  
H.

9. SOFT WAXEN VEIN.				
Oval lumps	tender	light	porous	GREYISH BROWN
				veins of mundic
				Sheppey Island

4. WITH CRYSTALLINE VEINS.

Diagophragmium  
Ferrugineum.  
H.

10. CRYSTALLINE WAXEN VEIN.				
Flat cakes	very hard	heavy	smooth	RUSTY BROWN
				bright crystalline veins
				Yorkshire

Diagophragmium  
Cæruleum.  
H.

11. BLUE WAXEN VEIN.				
Oval cakes	tender	heavy	ruddish	BLUEISH
				yellowish crystalline veins
				Yorkshire

5. CRUSTED WITH A NUCLEUS.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
12. LEMON WAXEN VEIN. Round lumps	hard	heavy	smooth	YELLOWISH BROWN	black nucleus, pale veins	Mendip	Brachyrenium Flavescens. H.
13. SMALL WAXEN VEIN. Oval balls	tender	light	rugged	BROWN	yellow veins, and earth within	Northamptonshire	Bezoarticum Minerale. H.
14. HOLLOW WAXEN VEIN. Turbinated balls	very hard	heavy	clay-like	GREYISH BROWN, YELLOW VEINS	a dusky hollow nucleus	Knightbridge	Brachyrenium Fuscum. H.



# N A T I V E F O S S I L S.

## C L A S S I X.

### S A L T S.

Soluble in water; and acrid to the taste.

## O R D E R I.

### A C I D S A L T S.

Sour to the taste, and corrosive; dissolving many bodies.

## G E N U S I.

### N I T R E.

A Prism of six sides, terminated at each end by a Pyramid of six sides: \* bitter, cold, and acrid to the taste.

---

\* This is the form of pure Nitre, perfectly crystallized; but this, and all other Salts, are often foul, and shapeless.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. PURE NITRE.							
Small crystals	tender	heavy	glossy	CLEAR	moist	Finland, in Rapikivi stone	Nitrum Nudum. L.
2. STONY NITRE ORE.							
Vast rocks	hard	heavy	plated	GREY	finely	Finland	Saxum Nitrosum. W.
3. BROWN NITRE ORE.							
Vast beds	brittle	light	duffy	DEEP BROWN	crumbly	Perfia	Terra Nitrofa Humacea. W.
4. WHITE NITRE ORE.							
Thick strata	hard	heavy	crack'd	WHITISH	firm	India	Terra Nitrofa Calcareo. W.
5. PLUMOSE NITRE.							
Small tufts	tender	light	thready	WHITE	crumbly	on rocks and walls	Nitrum Efflorescens. H.



**T**H E S E are all the appearances in which Nitre is seen. The first is very rare; the Crystals lie in little fissures of the Stone: the second, third, and fourth are the proper ores of this Salt: and in the fifth it shews itself from such ores, or others, in irregular crystalizations.

Nitre in all these forms is one thing; disguised by various mixtures, as we see the earthy Fossils also often are; but from any of them it may be obtained pure by crystalization.

Till lately, this quality of crystalization was supposed peculiar to Salts; till very lately indeed: for 'tis but within these three weeks I have found Spar may be dissolved and crystalized again in the manner of Salts. In the preceeding part of this work, \* I have lamented the ill success of four years trial: and formed my better hopes upon an assisting hand: that gentleman is absent from the kingdom; but my own farther trials have succeeded. The excellent Linnæus will be pleased with this; tho' it be contrary to his opinion; he only wanted to see *Terram, via humida, crystalisari posse abs sale*, to be less firm in the idea of all crystalization being owing to Salt. This

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\* Page 66.

ocular testimony is now given : and I must continue to remove the stony bodies out of the Saline System.

I am aware it will be objected by such as see but half way into philosophical enquiries ; that myself have proved Spar to have a Saline part ; by shewing it composed of the Mineral Acid, and Bitumen : but we must use precision in our words, as well as ideas, on these subjects. The Mineral Acid is not in itself a Salt : 'tis true, it forms them all by various mixtures. By another mixture, it forms Spar ; a Stone, with the form of a Salt ; but that form is its own : it neither is the form of any Salt, nor is caused by any Salt : and that is what remained to be proved : the question solely was, Do Spars owe their angulated forms, to any Salt ? and that is answered, No.



# A C I D S A L T S.

## G E N U S II. A L U M.

A dye of eight fides, with trigonal planes.  
Austere and astringent to the taste; bubbling in the fire.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. P U R E A L U M.							
Minute crystals	hard	heavy	polished	COLOUR- LESS	pellucid	England, in cracks of fossil wood	Alumen Commune. L. in medicine, and the arts.
2. R O C K A L U M.							
Small crystals	hard	heavy	smooth	REDDISH	clear	Italy, in cracks of marble	Alumina Romanum. L. in medicine, and the arts.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
3. RUDE ALUM.							L'Alun Vierge Solide. W.
Large masses	tender	heavy	irregular	GREYISH	opaque	Italy	for refining into alum.
4. PLUMOSE ALUM.							Alumen Plumosum. W.
Small tufts	soft	light	feathery	OLIVE-COLOUR'D	striated	Archipelago	a medicine.
5. GRANULATED ALUM.							L'Alun Farineuse. W.
A dry powder	tender	light	uneven	WHITISH	small granules	Yorkshire	for alum.
6. BLACK ALUM ORE.							Terra Aluminaris Nigra. W.
Vast cakes	hard	heavy	rugged	DEAD BLACK	bituminous	Yorkshire	for alum.



7. BROWN ALUMORE.

Great lumps soft light

uneven

UMBER-COLOUR'D

bituminous

Saxony

for alum.

Terra Aluminaris Fufca. W.

8. WHITE ALUMORE.

Small cakes hard light

rugged

PURE WHITE

alkaline

Archipelago

for alum.

Terra Melia Cæfalpin.

9. GREY ALUMSLATE.

Vaft strata hard heavy

plated

DUSKY GREY

flaty

Yorkshire

for alum.

Fiffilis Aluminaris Cinereus. W.

10. BLACK ALUMSLATE.

Vaft beds hard heavy

irregular

DEEP BLACK

fiffile

Yorkshire

for alum.

Fiffilis Aluminaris Nigra. W.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
<p>11. RED ALUM SLATE.</p>							
Great strata	tender	heavy	rugged	REDDISH	fiffle	Yorkshire	<p>Fiffilis Aluminaris Rubescens. W.</p> <p>for alum.</p>
<p>12. IRISH ALUM SLATE.</p>							
Vaft cakes	foft	heavy	irregular	DEAD BLACK	rudely fiffle	Ireland	<p>Lapis Hibernicus. H.</p> <p>a medicine for bruifes.</p>
<p>13. ALUM ROCK.</p>							
Great maffes	very hard	heavy	uneven	REDDISH WHITE	fiffle	Italy	<p>Calcareus Aluminaris. W.</p> <p>for alum.</p>
<p>14. COAL ALUM.</p>							
Vaft beds	hard	heavy	plated	BLACK	bitumi- nous	Northum- berland	<p>Lithanthrax Aluminaris. W.</p>



15. WOOD ALUM.	hard	heavy	coated	BROWN	wood-like	Bohemia	Alumen Vegetabile, W.
16. WEDGE ALUM.	hard	heavy	crack'd	BLACK	breaks in wedges	Sweden	Schistus Aluminosus Cuneiformis. Cr.

To these might be added, the Pyritæ, for they contain Alum; but Sulphur being more predominant, 'tis best to refer them thither. 'Tis thus the mixtures of nature render a perfect method in Fossils, in itself impracticable. Metals, added to Alum, make what we call, Vitriols.

# A C I D S A L T S.

## G E N U S III.

### V I T R I O L S.

A Rhomb more or less irregular.

Auftere to the taste.

## CRYSTALLIZED SIMPLE VITRIOLS.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. GREEN VITRIOL.							
Rude crystals	tender	heavy	uneven	PALE GREEN	six-sided	forest of Dean, in iron mines	Vitriolum Martis, L.
2. BLUE VITRIOL.							
Oblong crystals	hard	heavy	smooth	FINE BLUE	twelve- sided	island of Cyprus	Vitriolum Cyprinum, L.  a caustic.
3. WHITE VITRIOL.							
Rude crystals	tender	heavy	uneven	DEAD WHITE	twelve- sided	Germany	Vitriolum Album, L.  in medicine.



FORMED SIMPLE VITRIOLS.

4. STALACTITIC GREEN VITRIOL.						Vitriolium Ferri Stalacticum. W.	
Conic sta- lactites	firm	heavy	coated	PALE GREEN	hollow	Germany	for vitriol.
5. EFFLORESCENT GREEN VITRIOL.						Vitriolium Ferri Germinans. W.	
Downy tufts	tender	light	uneven	WHITISH GREEN	thready	Germany	for vitriol.
6. WHITE STALACTICAL VITRIOL.						Vitriolium Zinci Stalacticum. W.	
Oblong icicles	hard	heavy	coated	WHITE	hollow	Saxony	for vitriol.
7. WHITE EFFLORESCENT VITRIOL.						Vitriolium Zinci Efflorescens. W.	
Small granules	tender	light	irregular	WHITE	crumbly	Saxony, on Zinc ores	for vitriol.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
8. BLUE STALACTICAL VITRIOL. Short cones	hard	heavy	rough	FINE BLUE	hollow	islands of Archipelago	Vitriolum Cupri Stalacticum. W. for blue vitriol.
9. BLUE EFFLORESCENT VITRIOL. Bubblly lumps	tender	light	botryoide	PALE BLUE	crumbly	Cyprus	Vitriolum Cupri Germinans. W. for blue vitriol.
<b>MIXED VITRIOLS: SIMPLE AND FIRM.</b>							
10. HERMAPHRODITE VITRIOL. Small crystals	hard	heavy	rough	BLUE GREEN	clustery	Hungary	Vitriolum Hermaphroditicum. L. Vitriolum
11. ICICLE VITRIOL. Perfect icicles	tender	light	coated	PALE BLUE GREEN	hollow	Bohemia	Vitriolum Cæruleovirens Stalacticum. W.



12. TRIPLE VITRIOL.

Small cubes | hard | heavy

13. STALACTITIC TRIPLE VITRIOL.

Tender cones | soft | light

14. BYSSINE TRIPLE VITRIOL.

Tufts like moss | tender | light

15. GREY GREEN VITRIOL.

Coarse rhombs | hard | heavy

DEEP  
BLUE  
GREEN

plated

Germany

Vitriolum  
Triplum.  
L.

WHITISH  
GREEN

hollow

Goffelaer

Vitriolum Cupreo-ferreo-  
zincum Stalacticum.  
W.

FAINT  
GREEN

crumbly

Goffelaer

Vitriolum Cupreo-ferreo-  
zincum Germinans.  
W.

GREY  
GREEN

plated

Goffelaer

Vitriolum Zinco-  
ferreum  
Cristalliz.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
16. GLAUCOUS VITRIOL. Coarse crystals	tender	heavy	rugged	SEA GREEN	clustery	Saxony	Vitriolium Cinereum Cr.
S T O N Y V I T R I O L O R E S.							
17. RED VITRIOL ORE. Large masses	hard	heavy	irregular	BRICK COLOUR'D	cavernous	Archipelago	Vitriolium Chacitis. H.
18. GREY VITRIOL ORE. Rude lumps	brittle	light	uneven	PALE GREY	shattery	Archipelago	Vitriolium Sory. H.
19. YELLOW VITRIOL ORE. Large masses	hard	light	rugged	YELLOWISH	brittle	Archipelago	Vitriolium Misy. H.



20. BLACK VITRIOL ORE.

Great lumps

hard

heavy

rugged

DEAD  
BLACK

cavernous

Greece

Vitriolum  
Melantheria.  
H.

EARTH Y VITRIOLIC ORES.

21. CRUSTED VITRIOL ORE.

Flat lumps

tender

light

plated

BROWN

a yellow  
crust on it

Germany

Terra Vitriolica  
Crustata.  
H.

for vitriol.

22. RED VITRIOLIC EARTH.

Great cakes

firm

heavy

uneven

REDDISH

fine

Germany

Terra Vitriolica  
Rubra.  
W.

for vitriol.

FOR M.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
23. BLACK VITRIOLIC EARTH. Great masses	tender	heavy	rugged	BLACKISH	coarse	Germany	Terra Vitriolica Nigra W. for vitriol.
24. GREEN VITRIOLIC EARTH. Broad cakes	soft	heavy	rough	PALE GREEN	coarse	Germany	Terra Vitriolica Virefens. W. for vitriol.
25. BLUE VITRIOLIC EARTH. Flat cakes	tender	heavy	rugged	DIRTY BLUE	brittle	Ireland	Terra Vitriolica Cerulea. H. for vitriol.



S A L T S.

                      
O R D E R II.

A L K A L I N E.

Acrimonious, and fermenting with Acids.

G E N U S I.

N A T R U M.

A Prism of four sides, with pentagonal planes; with a Pyramid at each end, of two parallelogram planes.

Bitter to the taste; melting on the fire.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USE.
I. PERSIAN NATRON.							
Friable cakes	tender	light	uneven	PALE BROWN	crumbly	Persia	Natrum Antiquorum, L.
2. WALL NATRON.							
A tender efflorescence	soft	light	botryoid	WHITE	like hoar frost	on walls	Natrum Muronum, L.
3. SPRING NATRUM.							
Small crystals	firm	heavy	glossy	COLOUR- LESS	clustery	Bohemia, by fides of purgings springs	Natrum Fontanum, L.
4. EARTHY NATRUM.							
Great cakes	tender	heavy	uneven	BROWN	clayey	Palæstine	Natrum Hasselquisti, L.



Natrum  
Rupium,  
L.

5. LIMESTONE NATRUM.

A dry dust

light

uneven

WHITISH

crumbly

England,  
Italy,  
on limestone  
and marble

S A L L T S.

R.

ORDER III.

N E U T R A L.

Acrid; and not fermenting with Acids.

G E N U S I.

S A L A R M O N I A C.

Oblong, furrow'd, sharp-pointed Crystals.

Bitter, and urinous.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. CRUDE SAL ARMONIAC.							Ammoniacum Concretum. W.
Great cakes	hard	heavy	rugged	GREY	opaque	East Indies	a medicine.
2. SANDY SAL ARMONIAC.							Sal Cyrenaicum Antiq.
Great lumps	brittle	heavy	rough	BLACKISH	fandy	Greece	
3. EFFLORESCENT SAL ARMONIAC.							Ammoniacum Efflorescens. W.
Downy tufts	tender	light	rugged	WHITISH	crumbly	Perfia	
4. WHITE VESUVIAN SAL ARMONIAC.							Ammoniac Fossile Blanc. W.
Great cakes	tender	light	cavernous	GREYISH WHITE	fulphure- ous	Vesuvius	



Ammoniac Fossile  
Rouge.  
W.

Ammoniac Fossile  
Jaunatre.  
W.

Ammoniac Fossile  
Verd.  
W.

Ammoniac Fossile  
Noir.  
W.

5. RED VESUVIAN SAL ARMONIAC.

Rude lumps | hard | heavy

6. YELLOW VESUVIAN SAL ARMONIAC.

Rugged  
masses | hard | light

7. GREEN VESUVIAN SAL ARMONIAC.

Flat cakes | tender | light

8. BLACK VESUVIAN SAL ARMONIAC.

Great lumps | hard | heavy

Vesuvius

dufty

REDDISH

rugged

Vesuvius

fulphure-  
ous

PALE  
YELLOW

spungy

Vesuvius

cavernous

GREENISH

rugged

Vesuvius

spungy

BLACKISH

irregular

# NEUTRAL SALT S.

## G E N U S II.

### B O R A X.

A Prism of eight sides, with a truncated Pyramid at each end.

Disgustful to the taste; vitrifying in the fire.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. ROUGH BORAX.							
Rude cakes	hard	heavy	uneven	BLUEISH	opaque	East Indies	Borax Crudus. W. in medicine, and as folder to gold.
2. PURE BORAX.							
Small crystals	tender	heavy	polished	COLOUR- LESS	pellucid	East Indies	Borax Nodus. L. a medicine, and folder.



# NEUTRAL SALTS.

## G E N U S III.

### R O C K S A L T.

Cubic Crystals; or hexædral.

Sharp to the taste; crackling in the fire.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. PURE ROCK SALT. S A L G E M M E.							
Vast masses	hard	heavy	polished	COLOUR- LESS	transpa- rent	Poland	in food.  Muria Montana, L.
2. RED ROCK SALT.							
Great lumps	hard	heavy	rugged	RED	semipel- lucid	Hungary	Muria Rubescens, H.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
3. BLUE ROCK SALT.							
Vast masses	hard	heavy	polished	DEAD BLUE	clear	Hungary	Muria Cerulea. H.
4. GREEN ROCK SALT.							
Great masses	hard	heavy	smooth	GREEN	clear	Bohemia	Muria Virescens. H.
5. YELLOW ROCK SALT.							
Great lumps	hard	heavy	rugged	YELLOWISH	clear	Hungary	Muria Flavescens.
6. EFFLORESCENT ROCK SALT.							
Low tufts	soft	light	thready	WHITISH	granulated	Poland, on salt rocks	Muria Germinans. W.



Muria  
Terra.  
H.

Muria  
Lapidea.  
H.

Muria  
Marina.

7. EARTHY ROCK SALT.	light	cavernous	BROWN	saline to the taste	Hungary
Great cakes	soft				
8. STONY ROCK SALT.	heavy	rugged	PALE BROWN	saline	Hungary
Vaft maffes	hard				
9. SEA SALT.	heavy	irregular	BROWN	acid	rocks on the fea coast
Rude cryftals	hard				

# N E U T R A L S A L T S.

## G E N U S IV.

### S W I S S E S A L T.

Hollow Cubes; or hollow Pyramids.

Acrid to the taste; crackling in the fire.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. CUBIC SWISSE SALT.							
Small maffes	tender	heavy	rough	WHITISH	brittle	Swifferland	Neutrum Cubicum. W.
2. OBLONG SWISSE SALT.							
Little clusters	foft	heavy	rugged	YELLOWISH	firm	Germany	Neutrum Parallelipedum. W.
3. PYRAMIDAL SWISSE SALT.							
Small maffes	tender	heavy	rough	PALE BROWN	brittle	Bothnia	Neutrum Pyramidale. W.

That this is not Rock Salt, or Sea Salt, tho' nearly ally'd to it, is proved by chemical experiments.



N A T I V E F O S S I L S.



C L A S S X.

S U L P H U R E O U S:

Inflammable, electrical, soluble in oil.

G E N U S I.

S U L P H U R S.

Uniform, pure, or earthy; burning with a blue flame, and suffocating smell.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. CRYSTALLINE SULPHUR.							
Small masses	firm	heavy	glossy	PALE YELLOW	transpa- rent	Peru	Sulphur Vivum Pellucidum, W. medicine.
2. YELLOW NATIVE SULPHUR.							
Large masses	hard	heavy	smooth	STRONG YELLOW	opaque	Germany	Sulphur Vivum Opacum, medicine.
3. VESUVIAN SULPHUR.							
Tufts of threads	tender	light	bright	FAINT YELLOW	strong scented	Vesuvius, in cracks of rocks	Sulphur Vivum Capillare, W. medicine.
4. EFFLORESCENT SULPHUR.							
A dust	soft	light	granulated	PALE YELLOW	mild scented	Aix la Chapelle	Sulphur Vivum Efflorescens, W. medicine.



Sulphur Coloratum  
Album.  
W.

medicine.

Sulphur Vivum  
Coloratum.  
W.

a medicine.

Sulphur Coloratum  
Viride.  
W.

Sulphur Coloratum  
Nigrum.  
W.

for sulphur.

Vesuvius

Iceland

Vesuvius

Germany

soft

rough

bright

bitumi-  
nous

WHITISH

DEAD  
GREY

GREEN

BLACK

rugged

irregular

rugged

scaly

heavy

heavy

light

heavy

5. WHITE SULPHUR ORE.

Small masses

tender

6. GREY SULPHUR ORE.

Vast cakes

hard

7. GREEN SULPHUR ORE.

Large lumps

hard

8. BLACK SULPHUR ORE.

Great cakes

hard

# N A T I V E F O S S I L S.

## G E N U S II.

### M A R C A S I T E S.

Heavy, metalline, angulated bodies.

#### I. C U B I C.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. YELLOW CUBIC MARCASITE.							
Regular cubes	hard	very heavy	smooth	GREENISH YELLOW	angles entire	Northum- berland, in flats	for sulphur.  Marcasita Tessellaris. W.
2. YELLOW PRISMATIC MARCASITE.							
Oblong pieces	hard	heavy	smooth	YELLOW	irregular planes	Germany	for making sul- phur.



<p>3. STRIATED CUBIC MARCASITE.</p>	<p>Small cubes hard very heavy</p>	<p>WHITISH</p>	<p>friated contrary ways</p>	<p>Saxony</p>	<p>for brimstone.</p>	<p>Marcasite Cubica Striata de Lisle.</p>
<p>4. RHOMBOIDAL MARCASITE.</p>	<p>Large masses very hard heavy</p>	<p>YELLOW</p>	<p>crusted</p>	<p>Germany</p>	<p>for brimstone.</p>	<p>Marcasite Rhomboidalis. W.</p>
<p>5. TRUNCATED MARCASITE.</p>	<p>Large clusters hard heavy</p>	<p>DUSKY YELLOW</p>	<p>angles cut off</p>	<p>Sweden</p>	<p>for brimstone.</p>	<p>Marcasite Truncata. W.</p>
<p>6. FOURTEEN-SIDED MARCASITE.</p>	<p>Large clusters hard heavy</p>	<p>BRONZE OF GREEN AND YELLOW</p>	<p>thready</p>	<p>Germany</p>	<p>for brimstone.</p>	<p>Marcasite Decatefèrahadra. W.</p>

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
7. RUSTY MARCASITE.							Marcasita Profundius Truncata de Lisle.
Small cubes	hard	heavy	rugged	RUST COLOUR'D	fourteen faces	England, France	for brimstone.
8. EIGHTEEN-SIDED MARCASITE.							Pyrites Cryfallinus. Octodecahedrus. L.
Loose cubes	very hard	heavy	smooth	YELLOW	angles cut off	Sweden	for brimstone.
9. STRIATED RECTANGULAR MARCASITE.							Marcasita Cubica Striata de Lisle.
Great clusters	hard	heavy	scaly	GREENISH	striated	Germany	for brimstone.
10. TWELVE-SIDED MARCASITE.							Pyrites Cryfallinus Dodecahedrus. L.
Large clusters	very hard	heavy	smooth	BRASSY YELLOW	polished	Sweden	for brimstone.



2. P Y R A M I D A L:

<p>11. REGULAR PYRAMIDAL MARCASITE.</p>	<p>Large clusters hard heavy</p>	<p>GREENISH YELLOW</p>	<p>equal fides</p>	<p>Germany</p>	<p>Pyrites Crystalline Tetrahedrus. L.</p>	<p>for brimstone.</p>
<p>12. LONG PYRAMIDAL MARCASITE.</p>	<p>Small clusters hard heavy</p>	<p>BRIGHT BRASSY YELLOW</p>	<p>irregular</p>	<p>Germany</p>	<p>Pyrites Henkeli de Lisle.</p>	<p>for brimstone.</p>
<p>13. TRUNCATED PYRAMIDAL MARCASITE.</p>	<p>Great clusters hard heavy</p>	<p>BROWNISH</p>	<p>angles cut off</p>	<p>Germany</p>	<p>Pyrites Pyramidalis Truncatus de Lisle.</p>	<p>for brimstone.</p>

## 3. OCTAHÆDRAL.

Composed of two quadrilateral Pyramids, joined base to base.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
14. REGULAR OCTAHÆDRAL MARCASITE. Large clusters	hard	heavy	rough	GREENISH YELLOW	eight equal triangles	Saxony	Marcasite Octædre Regulier de Lisle, for brimstone.
15. LONG OCTAHÆDRAL MARCASITE. Single pieces	very hard	heavy	glossy	BRASSY YELLOW	eight unequal triangles	Saxony	Marcasite Octædre Allonge de Lisle, for brimstone.
16. IRREGULAR OCTAHÆDRAL MARCASITE. Small clusters	hard	heavy	scaly	YELLOW	eight irregular triangles	Germany	Marcasite Octædre Inegale de Lisle, for brimstone.



17. TRUNCATED OCTAHÆDRAL MARCASITE.

Great clusters

tender

light

polished

BRASSY

angles cut off

Saxony

for brimstone.

Marcasite Octædre Tronque de Lisle.

18. FLATTED OCTAHÆDRAL MARCASITE.

Clusters

hard

heavy

scaly

GREENISH YELLOW

low

Bohemia

for brimstone.

Marcasite Octædre Comprimic de Lisle.

19. OBLIQUE OCTAHÆDRAL MARCASITE.

Single pieces

hard

heavy

polished

GOLD YELLOW

oblique joinings

Germany

for brimstone.

Marcasite Octædre Oblique de Lisle.

20. BRONZ'D OCTAHÆDRAL MARCASITE.

Great clusters

hard

heavy

rugged

BRONZ'D GREEN

solid angles cut off

Saxony

for brimstone.

Marcasite Octahædre a 14 Facettes de Lisle.

4. POLYGONAL MARCASITES.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. TWELVE-SIDED MARCASITE.							
Great clusters	very hard	heavy	scaly	BRASSY YELLOW	two pen- tagonal Pyramids	Germany	Marcasite Dodecahedre de Lisle, for brimstone.
2. TWENTY-SIDED MARCASITE.							
Small clusters	hard	heavy	rude	GREENISH	twenty equilateral triangles	Saxony	Marcasite Icosaedre de Lisle, for brimstone.

N A T I V E F O S S I L S.

G E N U S III.

P Y R I T E S.

P Y R I T E S.

Globular, rugged, flattened, or hollow'd; and striated within.



FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. GLOBULAR PYRITES.							
Round, rough lumps	hard	very heavy	warted	FERRUGI- NEOUS BROWN	large striae	England	for sulphur.  Pyrites Figuratus Globosus. L.
2. HEMISPHERIC PYRITES.							
Great cakes	very hard	heavy	rugged	GREENISH BROWN	fine striae	Cornwall	for brimstone.  Pyrites Figuratus Haemisphericus. L.
3. HOLLOW PYRITES.							
Oblong masses	tender	heavy	rough	FERRUGI- NEOUS	tubular	Sweden	for brimstone.  Pyrites Figuratus Fritulosus. L.
4. PLATED PYRITES.							
Flatted masses	hard	heavy	scaly	GREENISH BROWN	upright scales	Sweden	for brimstone.  Pyrites Figuratus Laminosus. L.

[ 33 ]

## N A T I V E F O S S I L S.

G E N U S IV.

## M U N D I C.

Of no certain shape; heavy, and of a metalline aspect.

## I. BRIGHT, AND STRIKING FIRE WITH STEEL.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
I. SMOOTH MUNDIC.							
Flat masses	hard	heavy	even	DUSKY GREEN	bright	Cornwall	Pyrites Ferri <i>Æqualis</i> L. for sulphur.
2. GRANULATED MUNDIC.							
Great masses	hard	heavy	rugged	GREEN, AND VIOLET	bright, grain'd	Cornwall	Pyrites Ferri Granulatus. L. for brimstone.



3. STREAKY MUNDIC.	hard	heavy	smooth	PALE YELLOW	striated, and bright	Derbyshire	for brimstone.	Pyrites Ferri Chalybeatus. L.
2. IMPURE, DULL, AND SCARCE STRIKING FIRE WITH STEEL.								
4. SPANGLEY MUNDIC.	hard	heavy	scaly	WHITISH, AND YELLOW	full of spangles of talc	Germany	for brimstone.	Pyrites Cupri Micaceus. L.
5. TALCY MUNDIC.	tender	light	flaky	BROWN, AND YELLOW	with plates of talc	Sweden	for brimstone.	Pyrites Cupri Talcosus. L.
6. CHAFFY MUNDIC.	hard	light	rugged, and chaff-like	BLACK, BROWN, AND YELLOW	plates of talc and clay,	Germany	for brimstone.	Pyrites Cupri Acerosus. L.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
7. TAWNY MUNDIC.							Pyrites Cupri Fulvus. L.
Vast masses	hard	heavy	uneven	YELLOWISH BROWN	bright specks	Sweden	for brimstone.
8. GOLDEN MUNDIC.							Pyrites Cupri Flavus. L.
Small cakes	very hard	heavy	undulated	GOOD YELLOW	stony mixture	Germany	for brimstone.
9. GREEN MUNDIC.							Pyrites Cupri Virescens. L.
Great cakes	hard	very heavy	rugged	GREEN	shining	Sweden	for brimstone.
10. LIVER MUNDIC.							Pyrites Cupri Hepaticus. L.
Vast cakes	hard	very heavy	raised in lumps	RUDDY BROWN	fine	Sweden	for brimstone.



11. HONEYCOMB MUNDIC.

Rude lumps hard light

RUSTY  
YELLOW

coarse

Sweden

for brimstone.  
Pyrites Cupri  
Foraminosus.  
L.

12. FIRM MUNDIC.

Vast flat cakes very hard very heavy

GREENISH  
YELLOW

perfectly  
fine

Germany

for brimstone.  
Pyrites Cupri  
Compactus.  
L.

13. GRITTY MUNDIC.

Rough masses friable heavy

RUSTY  
YELLOW

coarse

Sweden

for brimstone.  
Pyrites Cupri  
Granulatus.  
L.

14. RHOMBIC MUNDIC.

Flat cakes hard heavy

GREENISH  
YELLOW

breaks in  
rhombs

Sweden

for brimstone.  
Pyrites Cupri  
Spatiformis.  
L.

F O R M.	H A R D N E S S.	W E I G H T.	S U R F A C E.	C O L O U R.	Q U A L I T I E S.	P L A C E.	U S E S.
<p>15. CRYSTALLINE MUNDIC.</p> <p>Rude lumps</p>	<p>very hard</p>	<p>very heavy</p>	<p>botryoide</p>	<p>GREENISH YELLOW</p>	<p>breakslike flint</p>	<p>Sweden</p>	<p>Pyrites Cupri Quartzosus. L.</p> <p>for brimstone.</p>
<p>16. STONY MUNDIC.</p> <p>Great masses</p>	<p>hard</p>	<p>heavy</p>	<p>rugged</p>	<p>YELLOWISH</p>	<p>very fine</p>	<p>Germany</p>	<p>Pyrites Cupri Cotaceus. L.</p> <p>for brimstone.</p>
<p>17. PURPLE MUNDIC.</p> <p>Vast lumps</p>	<p>very hard</p>	<p>heavy</p>	<p>rough</p>	<p>DEEP TAWNY PURPLE</p>	<p>coarse</p>	<p>Sweden</p>	<p>Pyrites Aquosus. L.</p> <p>for brimstone.</p>



# SULPHUREOUS FOSSELS.

## G E N U S V.

### A M B E R G R I S E\*.

#### A M B R A.

Light, tender, of a perfumed scent; swimming on water.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
Y. GREY AMBERGRISE.							Ambra Ambrosiaca.
masses very tender		very light	smooth	PALE GREY	crumbly	East Indies	in perfumes, and medicine.
W. WHITE AMBERGRISE.							Ambra Unicolora Alba. W.
masses brittle		light	scaly	WHITE	friable	Africa	perfume.

\* Feathers, and beaks of birds, and fish bones, are often found in Ambergrise.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
3. YELLOW AMBERGRISE. Rugged cakes	tender	light	rough	PALE YELLOW	very opaque	Madagascar	Ambra Unicolor Citrina. W. perfume.
4. BROWN AMBERGRISE. Rounded lumps	hard	heavy	coated	DUSKY BROWN	coarse	Greenland	Ambra Unicolor Fusca. W. a coarse perfume.
5. BLACK AMBERGRISE. Round lumps	hard	heavy	polished	JET BLACK	firm	Greenland	Ambra Unicolor Nigra. W. a coarse perfume.
6. COARSE AMBERGRISE. Rude masses	soft	light	cavernous	DIRTY BROWN	friable	North Seas	Ambra Vulgatior. L. a coarse perfume.



7. YELLOW MOTTLED AMBERGRISE.	very soft	light	uneven	PALE GREY, WITH YEL- LOW SPOTS	tough	Sumatra	Ambra Grisea Maculis Flavis. W.	the finest of per- fumes.
8. BLACK MOTTLED AMBERGRISE.	tender	light	rugged	GREY, AND BLACK	soft	Madagascar	Ambra Grisea Maculis. Nigris. W.	a very fine perfume.

U  
F  
2

# S U L P H U R E O U S F O S S I L S.

## G E N U S VI.

### A M B E R.

### S U C C I N U M.

Light, firm, fragrant when rubb'd, and electrical; sinking in water.

## I. NATURALLY PELLUCID.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. PURE YELLOW AMBER. Great cakes	firm	very light	polished	PALE YELLOW	pellucid	Prussia	Succinum Electricum. L. a medicine.
2. MILKY AMBER. Small masses	hard	very light	smooth	WHITISH	pellucid	East Indies	Succinum Pellucidum Album. W. medicine.
3. GOLDEN AMBER. Large lumps	firm	light	rumpled	GOLD YELLOW	pellucid	the Baltic	Succinum Pellucidum Favernum. W. medicine.
4. RUDDY AMBER. Small masses	hard	very light	wavy	DUSKY RED	pellucid	Prussia	Succinum Pellucidum Rubrum. W. in medicine.



2. NATURALY OPAKE.

5. WHITE AMBER.

Rude lumps hard

light

rugged

CHALKY  
WHITE

opake

Denmark

Succinum Opacum  
Album.  
W.

medicine, and the  
arts.

6. COARSE YELLOW AMBER.

Great cakes firm

very  
light

uneven

COARSE  
YELLOW

foul

Prussia

Succinum Opacum  
Flavescens.  
W.

medicine, and the  
arts.

7. BROWN AMBER.

Small cakes hard

light

smooth

YELLOWISH  
BROWN

foul

Prussia

Succinum Opacum  
Fuscum.  
W.

medicine, and the  
arts.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
8. GREY AMBER. Large lumps	hard	light	rugged	BLUEISH, OR GREENISH GREY.	foul	Germany	Succinum Opacum Cærulescens, W. in the arts.

Ambers, coloured by art, should be excluded from a collection of natural curiosities. 'Tis a nice method, and a difficult thing to accomplish; but there are some ingenious Polish Jews, who make a trade of it. A great deal of the pale yellow, streaky Amber has gone through their hands; and I have seen purple, and green Ambers, whose colours were not naturally their own.

Insects, in Amber, make a pretty addition to the kinds, kept in a cabinet; and they are best arranged separately after these; according to the distinct kinds of Amber, which contain them.

# S U L P H U R E O U S F O S S I L S.

G E N U S VII.  
W A T E R - O I L.  
N A P H T H A.

Very light; very thin; of a strong smell.



FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. COLOURLESS NAPHTHA.							
Watery	purest of fluids	lightest of fluids	bright	CLEAR	most inflammable	Media	for light. Naphtha Hyalina, L.
2. WHITISH NAPHTHA.							
Whey-like	pure	light	cloudy	BRIGHT	very inflammable	Persia	for lights. Bitumen Naphtha, L.
3. BROWN NAPHTHA.							
Oily	pure	very light	cloudy	PALE YELLOWISH BROWN	strong scented	Persia	in medicine. Naphtha Obscura, W.
4. RUDDY NAPHTHA.							
Oily	pure	light	bright	REDDISH	very strong scented	Italy	in medicine. Naphtha Rubescens, W.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
5. GREEN NAPHTHA.							Naphtha Viridis. W.
Watery	pure	light	very bright	GREENISH	less scented	Germany	

# SULPHUREOUS FOSSELS.

G E N U S VIII.

R O C K - O I L.

P E T R O L E U M.

Light; of the thickness of oil; ill smelling.



FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. YELLOW PETROLEUM.							Oleum Montanum Luteum, Wolt.
Oily	clear	light	bright	PALE YELLOW	very in- flammable	Italy	for lamps.
2. BROWN PETROLEUM.							Bitumen Petroleum. L.
X X Oily	foul	light	dufky	RUDDY BROWN	strong scented	Italy	for lights.
3. BLACKISH PETROLEUM.							Petroleum Oleum Terræ. W.
Thick	very foul	light	cloudy	BLACKISH BROWN	earthy	Germany	in medicine.

# SULPHUREOUS FOS SILS.

## GENUS IX.

EARTH-OIL.

MALTA.

Light; strong scented; thick as Tar.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. RUDDY MALTA. Scarce fluid	pure	light	bright	DEEP REDDISH BROWN	sticking to the fingers	Mount Caucasus	Bitumen Mumia. L. for mummies.
2. BLACK MALTA. Very thick	[foul	light	cloudy	BLACK	strong scented	Perfia	Bitumen Malthae L. for lights.



# SULPHUREOUS FOSSELS.

## G E N U S X.

### A S P H A L T H S. A S P H A L T A.

Light; tough like pitch; brittle; strong scented.

X X 2

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. PURE ASPHALT.							Bitumen Asphaltum. L.
Great cakes	brittle	light	rugged	DEEP BLACK	scented	Greece, and Sweden	in medicine.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
2. RUDDY ASPHALT.							Bitumen Hepaticum. L.
Vast lumps	hard	light	flaky	REDDISH	very stinking	Sweden	medicine.
3. TURFF ASPHALT.							Terra Bitumenosa Turfacea. W.
Thick strata	tough	light	most irregular	BLACKISH BROWN	full of roots	England	for firing.
4. DUSTY ASPHALT.							Terra Bitumenosa Humacea. W.
Great cakes	tender	light	rugged	BLACK	moulders to dust	Germany	firing.
5. SLATY ASPHALT.							Terra Bitumenosa Fissilis. W.
Thin strata	hard	heavy	plated	DEEP BLACK	fiffle	England	firing.



# SULPHUREOUS FOSFILLS.

## G E N U S XI.

### L I T H A N T H R A X.

Hard; heavy; stone-like.

FOR.M.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	P L A C E.	U S E S.
I. BRIGHT COAL. Vast strata	tender	heavy	flaky, and clean	SHINING BLACK	bright	England	Bitumen Lithanthrax, L. for firing.
2. DULL COAL. Vast strata	hard	heavy	rugged, and dusty	DEAD BLACK	obscure	England	Lithanthrax Durior, W. for firing.

# SULPHUREOUS FOSFILLS.

## GENUS XII.

### JET.

#### GAGAS.

Hard; light; amber-like.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. PURE Great masses	JET. hard	very light	smooth	FINE DEEP BLACK	swims on water	Germany	Bitumen Gagas. L. for ornaments.
2. BRITTLE Thick strata	JET. COAL brittle	light	rugged	DEEP BLACK	sinks in water	England	Lapis Ampelites. H. ornaments, and firing.



# SULPHUREOUS FOSSELS.

## G E N U S XIII.

### O R P I M E N T.

### A U R I P I G M E N T U M.

Talc; bright; flexible when pure; burning with a garlic smell.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. PLATED YELLOW ORPIMENT.							
Flat cakes	tender	heavy	polished	GOLD YELLOW	finest, like talc	Smyrna	Pyrites Auripigmentum.  in painting.
2. SPANGLED YELLOW ORPIMENT.							
Vast lumps	hard	heavy	scaly	PALE YELLOW	shattery	Turkey	Auripigmentum Flavescens. H. in painting.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
3. SPANGLED RED ORPIMENT*.							
Small lumps	tender	heavy	flaky	BRIGHT RED	in a grey coarse kind	Germany	Auripigmentum Cinnabareum. H.  painting.
4. SOLID RED ORPIMENT.							
Great lumps	hard	heavy	smooth	FINE DEEP RED	shattery	Greece	Sandaracha Autorum. H.  for painting.
5. EARTHY YELLOW ORPIMENT.							
Large lumps	soft	heavy	rugged	GOOD YELLOW	brittle	Germany	Zarnichium Flavum. H.  for painting.
6. EARTHY GREEN ORPIMENT.							
Great cakes	tender	heavy	rough	DIRTY GREEN	brittle	Germany	Zarnichium Virescens. H.  in painting.



7. EARTHY WHITE ORPIMENT.

Large lumps

brittle

heavy

rugged

WHITISH  
GREY

yellow  
spangles

Germany

in painting.

Zarnichium  
Albescens;  
H.

\* The Yellow Orpiments become red, by burning: but these are so in nature.

SULPHUREOUS FOSSILS.

G E N U S      X I V .

A R S E N I C .

A R S E N I C U M .

Crystalline; with truncated Prisms; burning with a garlic smell.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. PURE ARSENIC.							
Clusters of crystals	hard	heavy	polished	COLOUR- LESS	pellucid	Bohemia	a poison.  Arsenicum Nudum. L.
2. CRUSTED ARSENIC.							
Small lumps	tender	heavy	scaly	WHITISH	breaks in scales	Hungary	poison.  Arsenicum Testaceum. L.
3. FLAKY ARSENIC.							
Flat cakes	soft	light	plated	GREY	fissile	Sweden	a poison.  Arsenicum Squammosum. L.
4. HONEYCOMB ARSENIC.							
Rude lumps	hard	heavy	full of holes	WHITISH BROWN	stinking	Bohemia	a poison.  Arsenicum Porosum. L.



5. EARTHY ARSENIC.	Great lumps	tender	heavy	rugged	BLUE GREY	brittle	Bohemia	<i>Arsenicum Sulphuratum.</i> L.	a poison.
6. GLOSSY WHITE ARSENIC.	Rude lumps	hard	heavy	uneven	WHITE	full of white glittering specks	Sweden	<i>Arsenicum Albicans.</i> L.	poison.
7. CUBIC ARSENIC.	Small crystals	hard	heavy	crack'd	ASHY GREY	silvery white, when broke	Saxony	<i>Arsenicum Cubicum.</i> L.	poison.
8. OCTAHÆDRAL ARSENIC.	Small lumps	hard	heavy	polished	BLACK, OR GREY	very solid	Germany	<i>Arsenicum Crystallinum.</i> L.	a poison.

Authors speak of red Arsenics; but on trial, they do not yield the same kind of Regulus as the other Arsenics. They answer all the tests, as Orpiment; and I have therefore placed them there.

Whether Arsenic be a Sulphur, or a Metal; whether its Regulus be genuine, or not, is undetermined. I have placed it last in the Sulphureous Class, and next before the Metals.

# N A T I V E F O S S I L S.

## C L A S S XI.

### S E M I - M E T A L S.

Metalline; heavy; not malleable.

### G E N U S I.

#### Q U I C K S I L V E R.

#### H Y D R A R G Y R U M.

Silvery white; shining; fluid; volatile.



FOR M.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. VIRGIN QUICKSILVER.							Hydrargyrum Virgineum. L.*
Fluid	soft	very heavy	polished	SILVERY WHITE	moveable	Peru, Germany, Sweden	in medicine, gilding.
2. RUBY QUICKSILVER †.							Hydrargyrum Crystalinum. L.
A cubic crystal	tender	very heavy	bright	PURE RED	transpa- rent	Germany, Sweden	
3. STRIATED CINNABAR †.							Hydrargyrum Cinnabaris. L.
Flatted cakes ‡	hard	heavy	smooth	SCARLET	streaky	China	in medicine, and painting; and for quicksilver

\* The variation in the aspect, and mixture of the ores of Metals, is utterly without end. The great attempt must be to distinguish the principal Varieties; and under these, to arrange in the cabinet, those whose farther mixtures render them subor-  
dinately various again.

† All the Cinnabars are ores of Quicksilver, with Sulphur.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
4. FLAKY CINNABAR.							Hydrargyrum Cinnabaris $\alpha$ . L.
Rude lumps	hard	very heavy	scaly	STRONG RED	fibile	Hungary	for quicksilver.
5. GRANULATED CINNABAR.							Hydrargyrum Cinnabaris $\beta$ . L.
Coarse masses	tender	heavy	rugged	FINE RED	brittle	Germany	for quicksilver.
6. CRYSTALLIZED CINNABAR.							Hydrargyrum Cinnabaris $\gamma$ . L.
Small masses	hard	very heavy	polished	BRIGHT RED	shining	Saxony	for quicksilver.
7. JAPAN CINNABAR.							Hydrargyrum Glandulosum. L.
Small masses	very hard	heavy	smooth	SCARLET	glossy	Japan	in painting.



8. EARTHY CINNABAR.

Small masses

soft

very heavy

9. CRACKLING QUICKSILVER.

Small lumps

hard

very heavy

STRONG  
RED

dufty

ochreous

Sweden

Hydrargyrum Cinnabaris  
Friabilis  
Cronstedt.  
for quicksilver.

RAVEN  
GREY

smooth

crackles in  
the fire

Sweden

Hydrargyrum  
Cripetans.  
L.  
for quicksilver.

N A T I V E F O S I L S.

G E N U S II.

B I S M U T H.

V I S M U T U M.

[ Yellowish white; flaky; brittle, yet soft.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. FLAKY NATIVE BISMUTH.							
Flat masses	tender	heavy	scaly	SILVERY WHITISH	filice	Sweden	Vismutum Nativum Squammosum Cronstedt.
2. CUBIC NATIVE BISMUTH.							
Confused clusters	hard	heavy	irregular	YELLOWISH	little cubes	Saxony	Vismutum Nativum Cubicum Cronstedt.
3. EFFLORESCENT BISMUTH.							
A dust	tender	light	powdery	PURE WHITE	spreading on stones	Sweden	Vismutum Efflorescens Cronstedt.
4. SHATTERY BISMUTH ORE.							
Great lumps	brittle	heavy	scaly	SILVERY GREY	formed of broad flakes	Sweden	Vismutum Commune, L.



5. SPARKLING BISMUTH ORE.

Small cakes | hard | very heavy

6. WEDGY BISMUTH ORE.

Great lumps | tender | heavy

7. STREAKY BISMUTH ORE.

Flat cakes | hard | very heavy

Vismutum  
Squammosum  
Cronstedt.

Sweden

form'd of  
small  
scales

PALE  
YELLOWISH

rugged

Vismutum  
Cuneiforme  
Cronstedt.

Saxony

of wedge-  
like scales

DUSKY  
GREY

flaky

Vismutum  
Iners.  
L.

Germany

of striated  
scales

BLUEISH  
GREY

ridg'd

# N A T I V E F O S S I L S.

## G E N U S III.

Z I N K.

Z I N C U M.

Lead-colour'd ; brittle ; crackly ; composed of flatted Pyramids.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. CRYSTALLINE ZINK. Clusters of crystals	tender	very heavy	rugged	BRIGHT GREY	of slender truncated crystals	Germany	Zincum Crystallinum. L. in medicine.
2. INDURATED ZINK. Rude lumps	hard	heavy	smooth	WHITISH GREY	spar-like	Sweden	Zincum Induratum Cronstedt.



3. TILLY ZINK ORE.								Zincum Mineralifatum. L.
Large lumps	firm	very heavy	ridg'd	PALE GREY	of plates, like tiles	Germany		
4. PALE CALAMINE.*								Lapis Calaminaris Albecens Cronstedt.
Rude masses	tender	light	rugged	WHITISH BROWN	cavernous	England		for zink.
5. YELLOW CALAMINE.								Zincum Calaminaris. L.
Large lumps	hard	heavy	rough	PALE YELLOW	granulated	England		
6. RUDDY CALAMINE.								Lapis Calaminaris Rubescens Cronstedt.
Small masses	brittle	very heavy	rugged	REDDISH	stony	Poland		

\* All the Calamines are ores of Zink.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
7. CLAYEY CALAMINE.							
Great cakes	tough	heavy	smooth	YELLOWISH	soft	Germany	Lapis Calaminaris Argillaceus Cronstedt.
8. SWABIAN ZINK ORE.							
Vast masses	hard	very heavy	granulated	PALE GREY	glittering	Sweden	Zincum Swabii. L.
9. FIBROSE ZINK ORE.							
Small lumps	hard	heavy	striated	LEAD COLOUR'D	shining	Germany	Zincum Stibiatum & L.
10. RIDGED ZINK ORE.							
Small masses	very hard	heavy	uneven	LEAD COLOUR'D	upright scales	Sweden	Zincum Stibiatum β. L.



Zincum  
Sterile.  
L.

Zincum  
Chalybeatum  
Cronstedt.

Zincum  
Rapax.  
L.

Pseudogalena  
Virens  
Cronstedt.

<p>II. CUBIC BLENDE.*</p>	<p>Great lumps hard</p>	<p>very heavy</p>	<p>raised in ridges</p>	<p>BLACKISH GREY</p>	<p>bright, and scaly</p>	<p>Germany</p>
<p>12. STEEL-GRAIN'D BLENDE.</p>	<p>Great masses hard</p>	<p>heavy</p>	<p>rugged</p>	<p>LEAD COLOUR'D</p>	<p>glittering</p>	<p>Sweden</p>
<p>13. YELLOW BLENDE.</p>	<p>Flatted lumps</p>	<p>tender</p>	<p>smooth</p>	<p>PALE YELLOW</p>	<p>femi- transpa- rent</p>	<p>Hungary</p>
<p>14. GREEN BLENDE.</p>	<p>Small lumps hard</p>	<p>heavy</p>	<p>rugged</p>	<p>DULL GREEN</p>	<p>scaly</p>	<p>Germany</p>

\* All the Blendes are also Zink Ores.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
15. BLACK BLENDE. Vast masses	hard	very heavy	uneven	DEAD BLACK	breaks in flakes	Sweden	Pseudogalena Nigra Cronstedt.
16. BROWN BLENDE. Great cakes	tender	heavy	scaly	DIRTY BROWN	silice	Germany	Pseudogalena Fusca Cronstedt.
17. WHITE BLENDE. Rounded lumps	hard	heavy	granulated with fine scales	WHITISH	semi- pellucid	Sweden	Pseudogalena Alba Cronstedt.
18. LEMON BLENDE. Flat cakes	hard	very heavy	scaly, and glittering	VERY PALE YELLOW	pure	Sweden	Pseudogalena Pulchella Cronstedt.



Pseudogalena  
Rubescens  
Cronstedt.

Pseudogalena Sordide  
Fusca  
Cronstedt.

Zincum  
Crystallinum.  
L.

19. RUDDY BLENDE.

Great lumps very hard heavy

sparkling  
with small  
scales

REDDISH  
BROWN

rugged

Germany

20. UMBER BLENDE.

Vast cakes hard heavy

sparkling

FINE DARK  
BROWN

rough

Germany

21. CONGLOMERATE BLENDE.

Roundish masses hard heavy

breaks in  
octohedral  
forms

BLACK

rugged

Germany

# NATIVE FOSILS.

## GENUS IV.

ANTIMONY.

SIBIUM.

Fibrose; friable; silvery.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. NATIVE ANTIMONY. Rugged masses	tender	heavy	fibrose	WHITISH	pure	Sweden	Sibium Nativum. L. in medicine.
2. COARSE ANTIMONY ORE. Great cakes	brittle	heavy	rugged	LEAD COLOUR'D	thick striae	Germany	Antimonium Mineralisatum Craffius Cronstedt.



3. NEEDLE ANTIMONY ORE.

Small masses | tender | lighter

4. STEEL GRAIN'D ANTIMONY ORE.

Great lumps | hard | heavy

5. PYRAMIDAL ANTIMONY ORE.

Small masses | tender | lighter

6. RED ANTIMONY ORE.

Great lumps | hard | heavy

WHITISH  
GREY

striated

fine striae

Sweden

A. M.  
Tenuis  
Cronstedt.

STEEL-  
COLOUR'D

rugged

sparkling

Germany

A. M.  
Chalybeatum.

cavernous,  
and  
pointed

of concen-  
tric pyra-  
mids

Sweden

A. M.  
Crystallinum  
Cronstedt.

for antimony.

REDDISH

striated

of fine  
perfect  
striae

Saxony

A. M.  
Solare  
Cronstedt.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
7. PURPLE ANTIMONY ORE.							
Great masses	hard	very heavy	streaky, and rugged	DUSKY PURPLE	abrupt striae	Sweden, Hungary	A. M. Abruptum Cronstedt.
8. FEATHER'D ANTIMONY ORE.							
Small lumps	tender	light	feathery	SILVERY WHITE	friable	Germany	A. M. Argentiforme Cronstedt.
9. SILVER ANTIMONY ORE.							
Large masses	hard	very heavy	rugged	DARK GREY	rub to a red powder	Sweden	A. M. Argenteo Cupreum Cronstedt.
10. PRISMATIC ANTIMONY.							
Small lumps	hard	heavy	striated	BRIGHT	of multi- lated prisms	Sweden	A. M. Crysalifatum Cronstedt.



II. RADIATED ANTIMONY ORE,

Stibium  
Striatum,  
L.

Great lumps

tender

heavy

thready

LEAD  
COLOUR'D

of cross-  
ing striae

Germany

for letter-  
founders.

N A T I V E F O S S I L S.

G E N U S V.

C O B A L T.

C O B A L T U M \*.

Fine; brittle; steel-like; whitish grey; not fusible.

\* Cobalt has been denied to be a distinct Semi-Metal; but Brandt discovered, and Cronstedt confirmed the fact. Its glass, with the Phlogiston, makes a true Regulus.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. BLACK COBALT.							
Flat cakes	soft	heavy	dusty	DEAD BLACK	earthy, when broken	Germany	Cobaltum Calciforme Nigrum Cronstedt.  for arsenic.
2. SLAGGY COBALT.							
Great lumps	very hard	heavy	cavernous	DARK GREY	glossy	Sweden	Minera Cobalti Vitrea Cronstedt.
3. EARTHY RED COBALT.							
Great masses	tender	heavy	dusty	DEEP RED	earth-like	Sweden	Cobaltum Arsenicale Terreum Cronstedt.
4. RUBY COBALT.							
Small masses	very hard	very heavy	glossy	FINE RED	star-like rays	Saxony	Cobaltum Arsenicale Crystallinum Cronstedt.



5. STEEL-GRAIN'D COBALT.

Large lumps

hard

very heavy

rugged

IRON GREY

fine grain'd

Saxony

Cobaltum  
Chalybeatum  
Cronstedt.

6. COARSE-GRAIN'D COBALT.

Great masses

brittle

heavy

rough

BLACKISH

granulated

Saxony

Cobaltum  
Crassius  
Cronstedt.

7. ARBORESCENT COBALT.

Irregular masses

brittle

light

twiggy

SILVERY

in form of dendrita

Saxony

Cobaltum  
Dendriticum  
Cronstedt.

8. POLYHÆDRAL COBALT.

Rounded lumps

hard

heavy

many planes

GREY

shining

Saxony

Cobaltum  
Polyhædrum  
Cronstedt.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
9. PYRITINE COBALT.							
Rounded lumps	tender	heavy	botryoide	SILVERY	radiated, when broken	Norway	Cobaltum Radiatum Cronstedt.
10. WHITE POLYGONAL COBALT.							
Small lumps	hard	heavy	angulated	TIN COLOUR'D	bright	Sweden	Cobaltum Polygonum Cronstedt.
11. PALE GLASSY COBALT.							
Great lumps	very hard	heavy	irregular	PALE GREY	glassy	Sweden	Cobaltum Calciforme Album Cronstedt.
12. ORANGE COBALT.							
Great lumps	hard	heavy	angulated	REDDISH YELLOW	bright	Sweden	Cobaltum Glanz Cobalt. Cronstedt.



# N A T I V E F O S S I L S.

## G E N U S V.

### N I K E L.

### N I C C O L U M\*.

Solid; shining; reddish; crackly.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
Vast lumps	hard	very heavy	rugged	ORANGE COLOUR'D	glassy	Sweden	Niccolum Calciforme Vitrescens Cronstedt.

I. SILAIGGY NIKEL.

\* Linnæus doubts the reality of Nikel, as a distinct Semi-Metal; but the same arguments prove it, that prove the Cobalt fuch; which he allows. The world is infinitely obliged to the Swedish miners for the accurate experiments they have made on Ores: we have a new idea of the metalline art from their labours.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
2. SCALY NIKEL.							Niccolum Squammosum Cronstedt.
Small masses	hard	heavy	ridgy	DULL YELLOW	flaky	Sweden	
3. EARTHY NIKEL.							Niccolum Martiale Cronstedt.
Great cakes	brittle	heavy	dusty	DULL GREEN	clay-like	Sweden	
4. VITRIOLIC NIKEL.							Niccolum Vitriolatum Cronstedt. Cuprum Nikelum. L.
Small masses	tender	light	rugged	FINE GREEN	ochreous	Sweden	



# N A T I V E F O S S I L S.

## C L A S S XII.

M E T A L S.

M E T A L L A.

Heaviest of all bodies; fusible; and ductile.

G E N U S I.

G O L D.

A U R U M.

Soft; yellow; heaviest; and most ductile of all metals.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. SOLID NATIVE GOLD.							
Irregular lumps	tough	heavy	smooth	FULL YELLOW	massy	Peru, China, Africa	Aurum Nativum Solidum. L.
2. PLATED NATIVE GOLD.							
Flat masses	ductile	light in the mass	glossy	PALE YELLOW	flaky	Hungary, Peru	Aurum Nativum Membranaceum. L.
3. SAND NATIVE GOLD.							
Small lumps	tough	heavy	smooth	GOOD YELLOW	in granules	Africa	Aurum Nativum Fluviorum Cronstedt.
4. ANGULATED NATIVE GOLD.							
Small lumps	tough	heavy	polished	FINE YELLOW	in angulated lumps	Peru	Aurum Nativum Crystallinum. L.



5. ARBORESCENT GOLD.

Branch'd  
masses

tough

heavy

twiggy

PALE  
YELLOW

in form of  
dendritæ

Peru

Aurum  
Dendritum,  
N.

6. MARCASITE GOLD ORE.

Rude lumps

hard

heavy

smooth

BRASSY  
YELLOW

flaky

Sweden

Pyrites  
Aureus  
Cronstedt.

7. PALE GOLD ORE.

Large cakes

hard

very  
heavy

rugged

SILVER  
COLOUR'D

striated

Hungary

Aurum  
Mercuriale  
Cronstedt.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
8. GREY GOLD ORE. Small lumps	very hard	heavy	scaly	SILVERY GREY	glossy, when broke	Hungary	Aurum Ferream Cronstedt.

Henkel was positive there could be no Gold found in Marcasites; and others have thought that in the nature of things, there could be no Gold Ore: but experiments shew there may be such; and some of the Marcasites are of the number. It were a ruinous error, to suppose all the Marcasites had Gold; but I have seen some that yield two ounces from the hundred weight in certain pieces; tho' little in others, appearing from all obvious characters to be the same.

# N A T I V E F O S S I L S.

## G E N U S II.

### S I L V E R.

#### A R G E N T U M.

White; shining; very ductile; sonorous.



FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. FLAT NATIVE SILVER.							
Thin plates	soft	heavy	granulated	REDDISH WHITE	spread on the sur- face of stone	Potofi	Argentum Nativum Superficiale. L.
2. SPANGLED NATIVE SILVER.							
Small flakes	soft	heavy	bright	WHITE	in cracks of rocks	Potofi	Argentum Nativum Bracteatum. L.
3. GRANULATED NATIVE SILVER.							
Clusters of grains	soft	heavy	uneven	REDDISH WHITE	in cracks of rocks	Norway	Argentum Nativum Granulatum. L.
4. CAPILLARY NATIVE SILVER.							
Clusters of fine fibres	tender	heavy	thready	PURE WHITE	in cracks of rocks	Potofi	Argentum Nativum Capillare. L.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
5. ARBORESCENT NATIVE SILVER. In sprigs, in stone	soft	heavy	irregular	PURE WHITE	in masses of stone	Potosi	Argentum Nativum Dendroides. L.
6. CRYSTALLINE NATIVE SILVER. Square shoots	hard	heavy	polished	WHITE	in stone	Norway	Argentum Nativum Crystallinum. L.
7. HORNEY SILVER ORE. Rude masses	brittle	heavy	glossy	PEARLY YELLOWISH BROWN	in rocks	Norway	Argentum Corneum. L.
8. LEAFY SILVER ORE. Flat plates	hard	heavy	rugged	BLACKISH	on stones	Saxony	Argentum Vitreum Superficiale. L.



9. BRISTLY SILVER ORE.	Short spikes heavy	brittle	pointed	DARK GREY	in cracks of rocks	Sweden	Argentum Vitreum Subulare. L.
10. OCTAHÆDRAL SILVER ORE.	Rude octa- hædrallumps very heavy	brittle	polished	BROWN	in cracks of rocks	Saxony	Argentum Vitreum Crystallinum. L.
11. FLAKY GREY SILVER ORE.	Flat masses heavy	brittle	rugged	DARK GREY	red, when powder'd	Hartz forest	Argentum Rubrum Cinereascens. L.
12. SOLID GREY SILVER ORE.	Ill-shap'd lumps heavy	hard	smooth	PALE GREY	red, when powder'd	Saxony	Argentum Rubrum Solidum Cronstedte

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
13. GLANDULOSE RED SILVER ORE. Small maffes	brittle	heavy	rugged	FINE RED	full of rounded maffes	Germany	Argentum Rubrum Glandulosum. L.
14. RUBY SILVER ORE. Long sprigs	brittle	heavy	polished	RUBY RED	transpa- rent	Saxony	Argentum Rubrum Crystallinum. L.
15. WHITE SILVER ORE. Rude lumps	brittle	heavy	rugged	BRIGHT SHINING WHITE	glittering	Hartz forest	Argentum Album. L.
16. MASSY GREY SILVER ORE. Great lumps	hard	heavy	rough	PALE GREY	shining	Sweden	Argentum Cincereum Compactum. L.



17. GLOSSY GREY SILVER ORE.	Small clusters brittle heavy	shining	WHITISH	angulated figures	Sweden	Argentum Album Crystallinum. L.
18. PYRITIC SILVER ORE.	Flatted lumps brittle heavy	rugged	WHITE	striated	Sweden	Argentum Arsenicale, L.
19. SCALY BLENDE SILVER ORE.	Flatted masses brittle heavy	tily	LEAD COLOUR'D	shining	Sweden	Argentum Zincofum Squammofum Cronstedt.
20. BALL SILVER ORE.	Round lumps hard heavy	striated	GREY	bright, when broken	Germany	Argentum Zincofum Rotundatum Cronstedt.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
21. BLACK BLENDE SILVER ORE.							Argentum Zincofum Nigrum Cronstedt.
Rounded lumps	hard	heavy	scaly	BLACK	glossy, when broke	Sweden	
22. STEEL-GRAIN'D SILVER ORE.							Argentum Cinereum. L.
Flatted lumps	hard	heavy	granulated	IRON GREY	glossy	Sweden	
23. SOOTY SILVER ORE.							Argentum Nigrum. L.
Ragged masses	tender	heavy	scaly	DEAD BLACK	opaque	Sweden	



# NATIVE FOS SILS.

## GENUS III. WHITEGOLD. PLATINA.

White; hard; heaviest of Metals; scarce ductile.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	CLOUR.	QUALITIES.	PLACE.	USES.
Small grains	hard	most heavy	rugged	WHITISH	opaque	Rio da Pinto	Platinum. L.

\* I must express my doubts whether Platina be a Metal; or the grains we see be native, tho' they are understood to be so: 'tis near forty years ago that we became first acquainted with it. Maregrave supposed it a recement, after amalgamation of Gold, and he found Iron in it. Its weight is not to be accounted for this way; but joined to what Maregrave has said, I may add this one, unthought of trial. Mr. Wolf, excellent in his chemical knowledge, made a preparation from this, to be dissolved and viewed in the act of recrystallizing before the microscope; and thus it afforded Figures belonging to Quicksilver, and Iron; and to no other substances in the world.

# NATIVE FOSSILS.

## GENUS IV.

### TIN.

### STANNUM\*.

Blueish white; soft; malleable; crackling in bending, and but poorly ductile; fragrant.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
<b>I. CRYSTALLINE TINORE.</b>							
Angulated lumps	very hard	very heavy	polished	BLACKISH	crystalline	Cornwall, Saxony, and France †	Stannum Crystallinum. L.
<b>2. TIN GRAINS.</b>							
Small crystals	hard	very heavy	polished	BLACKISH BROWN	fatty on the surface	Cornwall	Stannum Granulatum. L.



3. TIN STONE.

Stannum  
Amorphum.  
L.

Large lumps

heavy

smooth

DEEP  
BROWN

glossy

Cornwall

4. SPAR TIN.

Stannum  
Spathaceum.  
L.

Round  
lumps

very  
heavy

streaky

PALE  
BROWN

glittering

Bohemia

\* It has been said, there was native Tin; but I think it is an error. A Mas was offered to me at a great price in 1731, which was an Arsenical Pyrites. Since that time, the ingenious Mr. Borlace of Cornwall, thinks he has found native Tin: The account caused letters to pass between us; in which, on my part, were proposed questions that would have determined the matter; but I am sorry to say, the answers were not satisfactory.

† It will seem strange that France is added here to the few places known to afford Tin; but 'tis mentioned, not from conjecture, but the most perfect certainty.

# NATIVE VENUS SILLS.

## GENUS V.

### LEAD.

### PLUMBUM.

Soft; blueish white; not sonorous; very ductile.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. MASSY NATIVE LEAD.							Plumbum Nativum Solidum. W.
Oblong lumps	soft	heavy	rugged	PALE GREY	covered with white powder	Saxony	
2. GRANULATED NATIVE LEAD.							Plumbum Nativum Granulatum. L.
Round granules	tender	heavy	smooth	BLUEISH	duffy white	Germany	



3. BUBBLY NATIVE LEAD.

Small, rough lumps soft heavy

4. CUBIC LEAD ORE.

Lumps of cubes hard heavy

5. OCTOHEDRAL LEAD ORE.

Large lumps hard heavy

6. ALUMINOUS LEAD ORE.

Small masses tender heavy

Plumbum Nativum  
Papillare.  
L.

Germany

dufty  
white

GREY

raised in  
bubbles

Plumbum Crystallinum  
Hexaedrum.  
L.

Germany

six even  
sides

WHITISH

scaly

Plumbum Crystallinum  
Octaedrum.  
L.

Saxony

eight un-  
equal sides

LEAD  
COLOUR'D

polished

Plumbum Crystallinum  
Tetradecahædrum.  
L.

Germany

fourteen  
sides

BLUEISH

glossy

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
7. TRUNCATED CUBIC LEAD ORE. Large clumps	hard	heavy	smooth	GREY	angles cut off	Sweden	Plumbum Crystallinum $\delta$ . L.
8. TWENTY-SIX-SIDED LEAD ORE. Loose pieces	brittle	heavy	scaly	BLUEISH	polygonal	Germany	Plumbum Crystallinum $\alpha$ . L.
9. CUBIC SILVER LEAD ORE. Vast masses	brittle	very heavy	flaky	BLACKISH BLUE	shining mixt cubes	Germany	Plumbum Galena Cubica. L.
10. GRANULATED SILVER LEAD ORE. Great masses	very hard	very heavy	rugged	BLUE GREY	rich in silver	Germany	Plumbum Galena $\beta$ . L.



11. CONFUS'D SILVER LEAD ORE.

Rugged lumps | hard | heavy

12. COMPACT LEAD ORE.

Vast masses | hard | very heavy

13. DOTTED LEAD ORE.

Great masses | hard | heavy

14. ANTIMONIATED LEAD ORE.

Great cakes | brittle | very heavy

Germany

glittering confusedly

IRON GREY

scaly

Germany

uniform

BLUEISH

smooth

Germany

shining in dots

BLUE GREY

uneven

Sweden

striated

LIGHT GREY

Plumbum Galassa γ. L.

Plumbum Compactum. L.

Plumbum Rauperum. L.

Plumbum Stibiatum. L.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
15. CLUSTER LEAD ORE.							
Rude lumps	brittle	heavy	streaky	BRIGHT GREY	cross tufts of fibres	Germany	Plumbum Basilinum. L.
16. GREEN LEAD ORE.							
Clusters of crystals	hard	very heavy	irregularly streak'd	GREEN, OR COLOUR- LESS	nitrous crystals	Bohemia	Plumbum Virens. L.
17. RUSSIAN LEAD ORE.							
Great masses of rhombs	hard	heavy	glossy	TAWNY	bright	Russia	Plumbum Rhombium. L.
18. SPARRY LEAD ORE.							
Vast cakes	brittle	heavy	flaky	WHITE	breaks in cubes	Germany	Plumbum Spatosum. L.



19. PELLUCID LEAD ORE.

Great lumps

hard

heavy

rugged

COLOUR-  
LESS

easily  
scraped

Germany

Plumbum  
pellucidum.  
L.

20. CERUSS LEAD ORE.

Thin cakes

brittle

light

duffy

WHITE

on lead  
ores

Sweden

Plumbum  
Calciforme  
Cronstedts.

M

E

T

A

L

S.

G E N U S VI.

C O P P E R.

C U P R U M.

Ruddy; tough; sonorous.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. MASSY NATIVE COPPER.							
Thick pieces	tough	heavy	rugged	REDDISH	solid	Virginia	Cuprum Nativum Solidum.
2. PLATED NATIVE COPPER.							
Flat cakes	very ductile	heavy	uneven	REDDISH	dull	Germany	Cuprum Nativum Superficiale. L.
3. FOLIACEOUS NATIVE COPPER.							
Irregular flakes	soft	heavy	uneven	RED	bright	Sweden	Cuprum Nativum Foliaceum, L.
4. EFFLORESCENT NATIVE COPPER.							
Flat, fibrous masses	tender	heavy	rugged	FINE RED	granulated	Germany	Cuprum Nativum Efflorescens, L.



5. CEMENT COPPER.

Rugged cakes

brittle

light

rugged

DULL  
REDDISH

botryoide

Germany

on iron.

Cuprum  
Præcipitatum.  
L.

6. OCTOHÆDRAL COPPER ORE.

Small lumps

hard

heavy

polished

REDDISH

trigonal  
faces.

East Indies

Cuprum  
Crystallinum.  
L.

7. RED GLASSY COPPER ORE.

Great masses

very hard

heavy

rugged

SCARLET

glassy  
within

Norway

Cuprum Induratum  
Rubrum  
Cristallit.

8. TAWNY GLASSY COPPER ORE.

Great cakes

hard

heavy

wrinkled

YELLOWISH  
BROWN

glassy  
within

Sweden

Cuprum Induratum  
Fulvum  
Cristallit.

F O R M.	H A R D N E S S.	W E I G H T.	S U R F A C E.	C O L O U R.	Q U A L I T I E S.	P L A C E.	U S E S.
9. GREY MARCASITIC COPPER ORE.							Cuprum Marcasiticum Griseum Cronstedt.
Great lumps	hard	heavy	rugged	BRASSY BLACKISH GREY	friated	Germany	
10. LIVER-COLOUR'D MARCASITIC COPPER ORE.							Cuprum Marcasiticum Lazureum Cronstedt.
Flat masses	very hard	heavy	coated	LIVER COLOUR'D	a blue crust	Sweden	
11. COMPACT BRASSY COPPER ORE.							Pyrites Cupri Solidus Cronstedt.
Great cakes	hard	heavy	smooth	GREENISH	breaks like brass	Germany	
12. STEEL-GRAIN'D BRASSY COPPER ORE.							Pyrites Cupri Chalybiformis Cronstedt.
Flat masses	hard	very heavy	rough	BRONZ'D YELLOW	breaks like iron	Sweden	



13. SANDY BRASSY COPPER ORE.

Great lumps

brittle

heavy

rugged

GREENISH  
YELLOW

glittering

Sweden

Pyrites Cupri  
Crassior  
Cronstedt.

14. OCTOHÆDRAL BRASSY COPPER ORE.

Clusters of  
crystals

shattery

heavy

angulated

octohæ-  
dral  
prisms

Sweden

Cuprum Crystallatum  
Octahædrium  
Cronstedt.

15. GOLDEN MARCASITIC COPPER ORE.

Great cakes

hard

heavy

scaly

PALE  
YELLOW

glittering

Sweden

Pyrites Cupri Pallide  
Flavus  
Cronstedt.

4

16. BROWN MARCASITIC COPPER ORE.

Flat cakes

brittle

heavy

flaky

RUDDY  
BROWN

bright

Germany

Pyrites Cupri  
Hepaticus  
Cronstedt.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
17. COMPACT GREY COPPER ORE.							
Rude lumps	tender	heavy	ethy	DARK GREY	cuts like black lead	Sweden	Minera Cupri Sulphurata Solida Cronstedt.
18. CUBIC GREY COPPER ORE.							
Flat masses	soft	heavy	smooth	IRON GREY	breaks in cubes	Sweden	Minera Cupri Sulphurata Cubica Cronstedt.
19. ARSENICAL COPPER ORE.							
Rude lumps	brittle	heavy	granulated	WHITE.	shining	Saxony	Cuprum Albidum. L.
20. STONY COPPER ORE.							
Coarse masses.	brittle	light	cavernous	RUDDY BROWN	coarse	Siberia	Cuprum Cotaceum. L.



Cuprum  
Schistofum  $\alpha$ .  
L.

Cuprum  
Schistofum  $\beta$ .  
L.

Cuprum  
Lazuli.  
L.

Cuprum  
Armenus.  
L.

21. GREEN SLATY COPPER ORE.

Flat cakes

hard

heavy

plated

DEEP  
GREEN

splits in  
thick  
plates

Germany

22. BLUE SLATY COPPER ORE.

Vast cakes

tender

light

scaly

DEAD  
BLUE

splits in  
thin scales

Sweden

23. LAZULAR COPPER ORE.

Large masses

very hard

heavy

smooth

FINE BLUE

white and  
gold spots

Asia

24. ARMENINE COPPER ORE.

Great lumps

hard

heavy

rugged

PALE BLUE

fine

Asia

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
25. MALACHITE COPPER ORE. Rude lumps	firm	heavy	kidney'd	FINE PALE BLUE	striated within	Bohemia	Cuprum Malachites. L.
26. BLUE EARTHY COPPER ORE. Small cakes	brittle	light	dufty	GOOD BLUE	clay-like	Saxony	Cæruleum Montanum Cronstedt.
27. GREEN EARTHY COPPER ORE. Rough lumps	tender	light	uneven	GREEN	ochreous	Germany	Viride Montanum Cronstedt.
28. RED EARTHY COPPER ORE. Thin cakes	soft	light	botryoid	RED	crumbly	Bohemia	Rubrum Montanum Cronstedt.



29. BLACK EARTHY COPPER ORE.

Small lumps

brittle

light

dufty

DEEP  
BLACK

crumbly

Sweden

Nigrum  
Montanum  
Cronstedt.

30. COAL COPPER ORE.

Great cakes

hard

heavy

flaky

BLACK

yellow  
spots

Germany

Cuprum  
Lithanthraceum  
Cronstedt.

# M E T A L S.

G E N U S VII.

I R O N.

F E R R U M.

Dark blue grey; glittering; sonorous; only malleable when hot.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. NATIVE IRON. Small, round lumps	hard	heavy	polished	RUDDY GREY	oily surface	Sweden	Ferrum Nudum. L.
2. RHOMBIC IRON ORE. Masses of rhombs	hard	heavy	smooth	RUDDY BROWN	bright, when broke	Sweden	Ferrum Tessulare. L.
3. CUBIC IRON ORE. Small cubes	tender	heavy	glossy	BROWN	regular cubes	Germany	Talcum Cubicum. W.
4. * POLYHÆDRAL IRON ORE. Rude lumps	hard	heavy	smooth	REDDISH	many faces	Sweden	Minera Ferri Polyhedra Cronstedt.



5. HONEYCOMB IRON ORE.	heavy	cavernous	RUDDY BROWN	glossy	Sweden	Minera Ferri Cellularis Cronstedt.
6. CLUSTER IRON ORE.	heavy	most irregular	GLOSSY, REDDISH	composed of small octohæ- dres	Sweden	Ferrum Crystallinum. L.
7. STEELY IRON ORE.	very heavy	smooth	DEEP GREY	compact	Sweden	Ferrum Chalybeatum. L.
8. BLACK DOTTED IRON ORE.	heavy	rugged	BLACKISH	rhombic spots	Sweden	Ferrum Siderum. L.

\* This Ore, when bedded in Limestone, acquires an addition of Sulphur, which it has in no other state. The excellent Cronstedt found this always: it happily comes in to the support of the doctrine of Sulphur, delivered in a preceding part of this work, under the article Spar.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
9. BLACK PLAIN IRON ORE. Vaft maffes	very hard	heavy	rude	DEEP BLACK	breaks in rhombs	Sweden	Ferrum Rhombicum, L.
10. LIVER IRON ORE. Great cakes	hard	heavy	even	LIVER COLOUR'D	breaks in rhombs	Sweden	Ferrum Hepaticum, L.
11. STEEL-GRAIN'D IRON ORE. Great maffes	very hard	heavy	rugged	RUDDY BROWN	black, when powder'd	Sweden	Ferrum Selectum, L. finest of ores.
12. FINE-GRAIN'D IRON ORE. Vaft lumps	very hard	very heavy	smooth	BLACK	sparkling	Sweden	Minera Ferri Retractoria Compacta Cronstedt.



13. GRANULATED IRON ORE.

Great masses hard heavy

Minera Ferri  
Retractoria Grossior  
Cronstedt.

Sweden

coarse

RUDDY  
BLACK

rough

14. SANDY IRON ORE.

Waft cakes hard heavy

Ferrum  
Arenosum,  
L.

Sweden

particles  
like sand

BLACKISH  
GREY

rugged

15. COMMON IRON ORE.

Great cakes hard heavy

Ferrum  
Commune,  
L.

Germany

irregular  
particles

BLACKISH

rough

16. SOFT IRON ORE.

Rugged lumps hard heavy

Ferrum  
Molle,  
L.

Sweden

spangles of  
marcasite

BLACK

rugged

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
17. TAUCY IRON ORE.							Ferruna Talcolum, L.
Vaft rocks	hard	heavy	fcaly	DARK GREY	white fpangles	Sweden	
18. MARBLE IRON ORE.							Ferruna Calcarium, L.
Great maffes	brittle	heavy	irregular	BROWN	black fhining grains	Sweden	
19. LINEATED IRON ORE.							Ferruna Decuffatum, L.
Great lumps	brittle	heavy	ftreaky	RUDDY BROWN	lines forming rhombs	Sweden	
20. GREEN IRON ORE.							Ferruna Virens, L.
Rude pieces	brittle	heavy	rugged	GREEN	specks of ruddy brown	Sweden	



21. GRANITE IRON ORE.

Great masses tender heavy

GRANITE,  
LIKE  
BLACK AND  
WHITE

shining  
black  
scales

Sweden

Ferrum  
Squamosum,  
L.

22. FINE-GRAIN'D EMERY.

Vast cakes hard heavy

STEEL  
COLOUR'D

reddish in  
powder

Greek  
Islands.  
Peru

Ferrum  
Smiris,  
L.

for polishing  
gems.

23. HARSH EMERY.

Great lumps hard heavy

REDDISH  
GREY

coarse  
grain'd

Sweden

Smiris  
Chalybeatus  
Cronstedt.

24. CUBIC EMERY.

Rude masses shattery heavy

REDDISH

glossy  
cubes

Sweden

Smiris  
Cubica  
Cronstedt.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
25. FLAKY EMEERY.							Smiris Squammosa Cronstedt.
Flat cakes	brittle	heavy	scaly	RUDDY GREY	thick scales	Sweden	
26. GLIMMERY IRON ORE.							Ferrum Micaceum. L.
Vast lumps	brittle	light	rugged	DARK GREY	shining scales	Sweden	
27. BLUE IRON ORE.							Ferrum Cærulescens. L.
Great cakes	hard	heavy	plated	STEEL GREY	blue scales	Sweden	
28. FIBROSE IRON ORE.							Ferrum Striatum. L.
Rude lumps	brittle	heavy	fibrose lines, rhombic forms	REDDISH GREY	breaks into rhombs	Sweden	



Ferrum  
Cellulosum.  
L.

Ferrum  
Haematites  $\alpha$ .  
L.

Ferrum  
Haematites  $\beta$ .  
L.

Ferrum  
Haematites  $\gamma$ .  
L.

29. HONEY COMB IRON ORE.

Rugged  
lumps

brittle

heavy

regularly  
cavernous

IRON GREY

upright,  
bright  
flakes

Sweden

30. RED BLOODSTONE\*.

Rounded  
lumps

hard

heavy

raised in  
great glo-  
bules

FINE RED

glossy,  
striated  
within

forest of  
Dean

31. BLACK BLOODSTONE.

Rounded  
masses

hard

heavy

botryoid

BLACK

shining

Germany

32. BLUE LIMESTONE.

Rugged  
masses

hard

heavy

raised in  
blunt  
cones

DEEP  
BLUE

glossy

Germany

\* The Emeries and Bloodstones are all Iron Ores. The Loadstone is an Iron Ore, which has the quality of attraction, nothing more.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
33. SOLID YELLOW BLOODSTONE. Rounded lumps	hard	heavy	rounded and smooth	PALE YELLOW	glossy	Sweden	Ferrum Hæmatites. $\delta$ . L.
34. FIBROUS YELLOW BLOODSTONE. Rough masses	hard	heavy	smooth	DEEP YELLOW	thick fibres	Bohemia	Ferrum Hæmatites Flavum Striatum Cronstedt.
35. KIDNEY BLOODSTONE. Cluster'd lumps	hard	heavy	botryoid	BLACK	rhombic, when broke	Sweden	Hæmatites Reniformis Nigrescens Cronstedt.
36. RADIATED BLACK BLOODSTONE. Masses of globes	hard	heavy	cluster'd round lumps	BLACK	thick striae within	Sweden	Hæmatites Niger Radiatus Cronstedt.



Hæmatites Niger  
Crystallifatus  
Cronstedt.

Hæmatites Ruber  
Solidus  
Cronstedt.

Hæmatites  
Crystallizatus  
Cronstedt.

Ferrum  
Rubricolum  
L.

37. FIGUR'D BLACK BLOODSTONE.

Rugged lumps  
hard  
heavy

38. SOLID RED BLOODSTONE.

Vast lumps  
hard  
heavy

39. CRYSTALLIZ'D RED BLOODSTONE.

Small masses  
hard  
heavy

40. STAINING BLOODSTONE.

Great lumps  
soft  
very heavy

DEEP  
BLACK

FINE RED

DEEP RED

GOOD RED

rhombic  
figures

glossy

raised in  
ridges

greasy

crystaliz'd  
within

compact,  
as flint

crystaliz'd  
within

stains the  
hands

Sweden

Germany

Germany

Germany

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
41. SANDSTONE IRON ORE. Vaſt maſſes	brittle	heavy	rugged	BLACKING THE HANDS	full of ſand	Sweden	Ferrum Arenofum. L.
42. REGENERATE IRON ORE. Vaſt maſſes	brittle	heavy	moſt uneven	RUSTY YELLOW	ſandy, formed on iron	Sweden	Tophus Marinus. L.
43. GLOMERATE IRON ORE. Great lumps	ſhattery	heavy	rugged	DARK GREY	of looſe octohæ- dral par- ticles	Sweden	Ferrum Glomeratum. L.
44. GREY IRON ORE. Great maſſes	brittle	heavy	rough	WHITISH GREY	breaks in rhombs	Sweden	Ferrum Spatofum. L.



Ferrum  
Magnes.  
L.

Magnesia  
Terrea  
Cronstedt.

Magnesia Alba  
Mineralis  
Cronstedt.

Magnesia  
Rubra  
Cronstedt.

in glass works.

45. THE LOADSTONE.

Great lumps hard heavy

46. SOFT MANGANESE\*.

Crumbly soft heavy

47. WHITE GLOBULAR MANGANESE.

Rounded hard heavy

48. PURPLE MANGANESE.

Rude masses hard very heavy

rugged	IRON GREY	attracts iron, and has its poles	Germany, Italy
rugged	DEAD BLACK	friable	England
botryoid	WHITISH	striated within	Norway
streaky	DEEP RED	radiated within	Italy

\* The Manganefes are Iron Ores; but so poor, some have deny'd them their place among these bodies. The excellent Cronstedt is one of those; and he is a guide in these matters, one would wish to follow; but I have try'd them, and there is not one but has some Iron. Experiment is the test to which I would reduce all opinions; and that obliges me to place the Manganefes among the Iron Ores, tho' last among them.

FOR M.	HARDNESS,	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
49. SOLID MANGANESE.							Magnesia Solida Cronstedt.
Great lumps	shattery	heavy	smooth	PURPLISH	metalline brightness	Germany	in glafs works.
50. STEEL-GRAIN'D MANGANESE.							Magnesia Chalybeata Cronstedt.
Large cakes	hard	heavy	rugged	IRON GREY	bright, and shining	Sweden	
51. RADIATED MANGANESE.							Magnesia Radiata Cronstedt.
Great lumps	shattery	heavy	streaky	REDDISH	radiated within	Sweden	
52. KIDNEY'D MANGANESE.							Magnesia Crytallifata Cronstedt.
Connected balls	brittle	heavy	kidney'd	REDDISH GREY	glossy	Sweden	



Rude lumps

hard

heavy

streaky

IRON GREY

coarse fibres

Sweden

F O S S I L S.

C L A S S XIII.

S L A G S.

S C O R I Æ.

Mineral bodies, calcin'd by subterranean fires.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. ICELAND AGATE.							
Rough cakes	hard	heavy	undulated	GREENISH BLACK	semi- transpa- rent	Mount Hecla, and Ascension Island	Achates Islandicus Cronstedt.
2. RHINLAND MILLSTONE.							
Vast masses	hard	heavy	cavernous	BLACK	glass-like	Germany	Lapis Molaris Rhenacus. L.
3. PEARL SLAG.							
Clusters of globules	hard	heavy	botryoide	GREENISH GREY	glassy	Isle of Af- cension	Scoria Margaritacea Cronstedt.
4. ASHY SLAG.							
Granulated dust	tender	light	rough	GREY	crumbly	Vesuvius	Scoria Pulverulenta Cronstedt.



Scoria  
Lava.  
H.

Pumex  
Vulcani,  
L.

Pumex  
Niger  
Cronstedt.

Pumex  
Ferri,  
L.

5. L A V A S L A G.

Rude lumps

hard

heavy

rugged

MIX'D OF  
ALL CO-  
LOURS

glassy

Vesuvius

6. COMMON GREY PUMICE.

Irregular  
lumps

brittle

light

cavernous

of bristly  
fibres  
within

Vesuvius,  
Ætna

7. B L A C K P U M I C E.

Vast cakes

brittle

light

rugged

BLACK

spunge-  
like

Vesuvius

8. I R O N P U M I C E.

Flat masses

brittle

heavy

botryoide

PALE  
REDDISH

spungy

Volcanos,  
and Iron  
Forges

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
9. COPPER PUMICE.							Pumex Cupri. L.
Great masses	brittle	light	frothy	RED	spongy	Ile of Ascension	

These are a sort of additional substances to a Fossil catalogue; but they ought to have a place in a cabinet: indeed the Lavas of Vesuvius might make a cabinet alone: but Philosophy must acknowledge it knows little of them.

We should wish to be acquainted with the history of the Fossils, of which they are calcinations, in their native and original state, and that way to be able to refer them to the bodies to which they belong; but of this we have no hope. We know not what were the Fossils of Vesuvius before they were burnt; nor can all the furnaces of chemistry produce such substances as these volcanic fires of nature.

F I N I S.

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# I N D E X.

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